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BIOMEDICAL AND BEHAVIORAL SCIENCES

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USSR REPORT
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BIOMEDICAL AND BEHAVIORAL SCIENCES

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AEROSPACE MEDICINE

CONFERENCE ON PSYCHOLOGICAL ASPECTS OF TRAINING SIMULATORS

Yerevan KOMMUNIST in Russian 30 Apr 84 p 4

KANKANYAN, Yu.

[Abstract] The article is an interview with Doctor of Psychological Sciences, Professor Yuriy Mikhaylovich Zabrodin, deputy director of the USSR Academy of Sciences' Institute of Psychology, regarding problems of engineering psychology and operator training which were discussed at the Second All-Union Conference "Psychological Aspects of Training Simulator Construction", which was held in Tsakhkadzor April 17-20.

Zabrodin relates that the conference was concerned in particular with psychological aspects of processes for training equipment-operators of advanced technology, such as the control systems of large industrial units. Processes employing devices which simulate the operation of certain mechanisms of technical systems were examined.

Zabrodin points out that the growing use of simulators as training aids necessitates changes in conventional notions of the simulator as an imitative device. Simulators' functions and training capabilities must be expanded, in particular. The development of so-called psychological training simulators is said to hold much promise in this connection. With them, the training process begins with the development of a flexible, nonspecific system of skills and aptitudes in operators, which facilitates their subsequent training in specific types of operations. Zabrodin reports that work on the development of such simulators is in progress at the Yerevan State University's engineering psychology laboratory, which is headed by Candidate of Psychological Sciences R. Aguzumyants. This laboratory has been working on problems of the reliability and efficiency of 'man-machine' systems. Results of this research are being successfully employed in the development of systems for training telegraph operators and operators of chemical production facilities and nuclear power stations. The creation of a scientific research center of applied psychology in the Armenian republic should receive serious consideration in this connection, according to Zabrodin.

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BRIEFS

BIONAUT--A NEW PROFESSION--Krasnoyarsk-- Bionauts- this profession is not yet to be found in dictionaries or encyclopedias. It is only being born in the laboratories of Siberian scientists. Nikolay Bugreyev and Sergey Alekseyev, scientific associates of the Krasnoyarsk Institute of Biophysics of the Siberian Department of the USSR Academy of Sciences have already been christened in this profession. They spent five months in a hermetic chamber "Bios-3". This closed biological system, which includes a man, is working at present on the Earth. But its creators believe that in the not too distant future it will be used in space too. Complex regenerating systems for purification of water and air are working at present on spaceships and space stations in orbit. In "Bios-3" this is done by plants. And they are used as food too. Famous agriculturists can only be envious of the results of this experiment: wheat in "Bios-3" gives 100-130 quintals of grain per hectare in relative calculation. And furthermore it yields several times a year. During the experiment, Bionauts cooked for themselves, baked their own bread and looked after the complex equipment. [Text] [Moscow TASS in Russian 1030 gmt 22 Apr 84]

CSO: 1840/611

INTEGRATION IN PLANT PROTECTION

Moscow ZASHCHITA RASTENIY in Russian No 1, Jan 84 pp 14-16

[Article by N. M. Golyshin, academician secretary of the Plant Protection Department, Academy of Agricultural Sciences imeni V. I. Lenin]

[Text] It is practically impossible to increase the efficiency of and provide stability in agricultural production today without resolving problems of protecting plants from pests, diseases, and weeds. This position was emphasized in the USSR Food Program, which calls for making a maximum reduction in harvest losses due to harmful organisms with minimum danger of environmental pollution.

Research is being carried out in accordance with a combined scientific and technical program confirmed by the State Committee for Science and Technology and in accordance with departmental plans, which call for the participation of the All-Union Plant Protection Scientific Research Institute, the VNIIIBMZR [expansion unknown], the All-Union Agricultural Microbiology Scientific Research Institute, the All-Union Chemical Means of Plant Protection Scientific Research Institute, the All-Union Microbiological Plant Protection and Bacterial Preparations Scientific Research Institute, the VNITIKiZR [expansion unknown], republic plant protection institutes, industrial institutes, scientific institutions under the USSR Academy of Sciences, and other departments.

The general direction of this work is the development and improvement of combined, and ideally, integrated systems for plant protection that are based on a harmonious combination of preventive and extermination measures and rational utilization of all tactics and methods in the battle against harmful organisms, taking into account mechanisms of natural regulation of interrelations among leading components of agrobiocenoses.

In the country more than 20 unionwide and 60 zonal systems have been developed and are being implemented; the proper and timely application of these systems makes it possible to prevent losses in the harvest of major agricultural crops. New systems are being developed and existing ones are being improved constantly, taking into account scientific and practical achievements, the appearance of new data in the area of forecasting and signalling the development of harmful organisms, the thresholds at which phytophages and phytopathogens are harmful, or criteria for measuring the number of

entomophages and other useful objects, and the development of more effective methods and means of protection.

During the current five-year plan methods for developing forecasts and signalling are being improved by generalizing the latest research on the ecology, physiology, and etiology of harmful species; this has made it possible to reduce outlays on collecting data and at the same time, to increase the reliability of the forecasts. Automated methods of forecasting and signalling have been developed on the basis of model projects. The sphere of application has expanded and there has been improvement in the technology of applying long-range methods of diagnosing the health status of plants.

A great deal of attention has been devoted to extensive production verification of economic thresholds of the damage caused by the primary pests of major agricultural crops. This work is being carried out in 33 oblasts and autonomous republics of the RSFSR, as well as in Azerbaijan, Belorussia, Georgia, Moldavia, the Ukraine, Tajikistan, Estonia, and other union republics. Data have been prepared and completed on the economic thresholds of damage caused by 100 primary species of insects, which will make it possible to introduce these criteria in various zones throughout the country.

It is widely known that resistant varieties which permit more efficient use of plant protection means with a simultaneous reduction in the danger of pesticide pollution of the environment are an important component of integrated systems. When a new variety is introduced, it is important to consider that it acts as an ecological niche for parasitic and epiphytic microflora, and elimination of a predominant parasite is followed by the appearance of a new parasite, and the interrelation with the new parasite can sometimes be less balanced and thus more destructive to the plant. In connection with this, in worldwide practice more and more preference is being given not to immune varieties, but to relatively resistant varieties, the damage to which is limited by the level at which no negative effects occur in the plant. This type of resistance is maintained significantly longer than the "vertical" type of resistance found in highly resistant varieties.

The property of endurance as a result of the varying sensitivity of varieties to disease or damage takes on a great deal of importance. The over-all resistance of plants to unfavorable conditions and the expression of these adaptive qualities can serve as a basis for creating varieties with combined resistance to the most important diseases and pests. The effect of the variety on an agrobiocenosis is not limited to its influence just on phytophages, it also extends to entomophages; that is, to the triotroph system which offers great possibilities for increasing the efficient management of agrobiocenoses.

In areas sown with varieties characterized by one of the forms of resistance and endurance or a combination, the threshold levels of damage increase several-fold; in many cases this makes it possible to eliminate or limit chemical protection and to reduce the intensity of application of other means used in the battle against harmful organisms. An example of this can be seen in varieties of corn that are resistant to the Swedish fly, and potato varieties that are resistant to the Colorado potato beetle, phytofluorosis, cancer, and so on.

In the area of plant immunity the basic directions of research during the current five year plan are: resolving theoretical questions tied to determining and revealing the mechanism of plants' immunological reactions to harmful objects, including the study of food communication ties between pests and the plants they feed on; development and improvement of methods (including accelerated methods) for determining varieties and hybrids that are resistant to or have a tolerance for pests and diseases; as well as possible donors of resistance (on the basis of an analysis of the genetic diversity of the plants) to them and the transmission of models for inclusion in the selection process.

Work has been started on creating functional models of highly productive varieties with combined resistance to harmful organisms and these models are included in the selection process. Together with selection centers, programs have been developed for growing corn hybrids with combined resistance to the corn moth, the Swedish fly, the grass aphid, fusariosis, and blister rust.

As a result of the evaluations performed by plant protection institutes, over 700 models with increased resistance have been isolated; they include a wheat specimen resistant to warehouse pests, the Hessian fly, rust, and mildew; corn that is resistant to grass aphids, and corn and stalk moths; barley that is resistant to reticular helminthosporiosis and other diseases; potatoes that are resistant to the Y, X, M, and S-virus strains, to the potato nematode, the Colorado potato beetle, and cancer; flax that is resistant to bacteriosis; sorghum that is resistant to grass aphids; alfalfa that is resistant to flower gall bugs; clover that is resistant to fusariosis and cancer; peas that are resistant to the pea aphid; and cabbage that is resistant to the cabbage fly. A number of varieties with combined resistance have been found.

Agrotechnology of agricultural crops forms the foundation for integrated plant protection. The primary task is to create the optimal conditions for plant development and unfavorable conditions for the mass reproduction and spread of harmful organisms. In connection with this, when industrial methods are used to cultivate agricultural crops it is necessary to evaluate once again existing and new agrotechnical methods from the standpoint of plant protection. First and foremost, it is necessary to study the effect of the extent of saturation of specialized crop rotations; the systems and techniques used for soil cultivation; the time periods and norms for planting seeds; the role of predecessors; mineral and organic fertilizers, land improvement and other agricultural techniques in the development, dynamics, and number of pests; and the effect of diseases and weeds and areas sown with grain, industrial, and other crops in relation to soil and climatic conditions, zones, and regions of the country.

An evaluation was made of agrotechnical recommendations for regulating the quantity of and damage caused by pathogens and insects in agroecosystems, as well as the importance of these techniques as protection against harmful organisms in the cultivation of corn, sugar beets, sunflowers, and other crops using industrial methods. As a result, a number of important relationships have been established. For example, it was determined that in grain fields infested extensively with harmful organisms such as the ground beetle, root rot, and others, in the European part of the USSR an acceptable level of saturation for

rotation of a specialized crop is no higher than 50 percent; in the presence of oat worm, it is no higher than 20 percent; in northern Kazakhstan, it is about 75-80 percent. It has been shown that soil protection technology for cultivating wheat in Kazakhstan and Siberia does not alter in any significant way the health status of the crops when compared to traditional systems used in farming. It has also been established that an increase in the proportion of grain crops in the crop rotation to 70 percent and above intensifies the harm caused by root molds. Other interesting data have also been obtained.

Creative application of agrotechnical methods is one of the most powerful means of improving the health status of crops. At the same time, the agrotechnical approach does not require additional expenditures and can be combined easily with biological and other methods of plant protection; to a greater extent than other methods, it is capable of changing ecological conditions in the direction man needs them to be changed.

One of the most important tasks in creating integrated programs for plant protection is the improvement of chemical methods. Research in this area is being conducted in the following basic directions: development of the theoretical foundations for controlled synthesis of the most effective and environmentally safe pesticides; testing of new chemical means for inclusion in the list of preparations that can be used for agricultural purposes; preparation of standardized methods for identifying pesticides; the study of the dynamics of their residual quantities and behavior in plants and other objects in the environment with the aim of replacing persistent, cumulative highly toxic pesticides with less dangerous and more selective ones, as well as developing safe regulations for their use; the introduction of norms and systems for their rotation; and research on mixtures and contemporary methods for using pesticides based on economic thresholds for the damage caused.

Forms of harmful organisms that are resistant to preparations are being studied; research is being done on ways to overcome their resistance; methods, machinery, equipment, and devices for applying means of protection are being improved, as are other methods for increasing the effectiveness and safety of pesticides with regard to man and the environment.

In 2 years about 250 preparations were tested. In 1982, 36 new preparations were added to the List of Chemical and Biological Means and the range of application of 30 preparations was expanded. In the 1983 supplement 113 new pesticides or pesticides with new regulations were added. Today 400 preparations and their various forms are recommended for agricultural use. Proposals have been developed for the combined use of a number of herbicides and fertilizers. Optimal parameters have been determined for the use of pesticides in systems for protecting indoor vegetable crops, grain, potatoes, alfalfa, fruit and berry crops, and more. Systems have been developed for applying herbicides when industrial methods of cultivation are used in the country's various zones.

There is continued improvement in the methods, equipment, devices, and technology used in the application of pesticides. This research has been directed at reducing the quantity and volume of chemical treatments used on plants and providing the conditions for activating natural enemies of pests.

The biological method for plant protection is being developed in the direction of utilizing natural populations of microbial antagonists, entomopathogens and entomophages, industrial breeding and release of useful insects and the production of biological preparations.

Research is being done on the specific composition of trichogram in biocenoses and agrocenoses and on the possibilities of improving the quality of the ovoparasites' searching ability, as well as systems for their breeding, storage, and distribution; the strategy for their application is being improved, and so on. Nutrient media are being developed, in addition to separate elements of lines and the technology for mass cultivation and use of the golden nematode; natural resources are being uncovered and the specific composition of parasites and predators of the most important pests is being defined more precisely; methods are being sought for preserving promising species under conditions of intensified agricultural production; technology is being improved for the use of encarsia and coccinellide; virulent strains of microorganisms, fungi, superparasites and antagonists pathogenic in pests are being isolated and selected; methods for improving the quality of microbiological preparations and the technology of their use are being developed.

As a result, some important data have been obtained which make it possible to improve the production and application of biological means, and to activate natural entomophages. For example, a methodology has been developed for infecting grain with sitotrog, together with a model for it; a linear correlation has been found between the effectiveness of trichogram and its quality; a method has been proposed for long-term storage of an ovovore; a process has been prepared for using this method in corn, beets, cabbage and other crops. A device has been developed for continuous thermal disinfection of grain against the production of the grain moth. The equipment used to spread trichogram on a number of different crops both on the ground and from the air has been improved. It is now possible to use goldeneye larvae against the whitewing and melon aphid, and encarsia against the whitewing on tomatoes grown in hothouses. A recipe for artificial nutrient media has been developed for common goldeneye larvae. A study has been made of the specific composition and dynamics of populations of aphidophages in grasses in Krasnodar Kray, the Crimea, the Baltic region, and western Siberia. A group of entomophage web spinners has been found in vegetable crops and potatoes, in addition to predatory insects that destroy the Colorado potato beetle. Out of the various groups of insects, 14 crystal-forming bacillus thuringiensis cultures were isolated, in addition to fungus strains of the ashersonia and verticillium genera, which are highly active against the whitewing, and very promising for use in the production of entomophage virus strains and types of fungi that are superparasites and antagonists.

Extensive research has also been done in the area of biologically active substances, and biophysical and genetic methods. Juvenoids, inhibitors of chitin synthesis, chemosterilants, and pheromones have been synthesized and tested. In 1982 alone over 300 substances were tested, among which promising juvenoids were found for the hothouse whitewing, in addition to chitin synthesis inhibitors for a number of scale insects, and pheromones for cotton

and winter moths, the California beetle, the Comstock caterpillar, the potato moth, garden leaf rollers, apple maggots, the cabbage moth, borers, and so on. The technology involved in using pheromone sterilant traps has been improved and methods have been studied for male vacuum and disorientation. There has been continued research using the radiation sterilization method.

During the current five-year plan scientific research institutions have a great deal of work to do in perfecting zonal integrated plant protection systems. For example, it is necessary to intensify the preparation of effective methods for calculating the number of pests, diseases, and weeds, as well as the evaluation of the health status of areas under cultivation, and automated methods for predicting the number of harmful organisms and processing the incoming data. Work should be continued on improving the assortment of chemical and biological means used in the campaign, and on improving the methods and processes used in their application; work should also be continued to specify norms for the consumption of pesticides and the periods of their application; there should be continued study of mixtures of preparations for various purposes in different zones with industrial cultivation methods. There should be an intensified search for ways to overcome and prevent the development of harmful forms of organisms that are resistant to pesticides. Research should be also expanded in the search for new biological substances, and in particular, greater work should be done to find the most effective entomophages and microorganisms that are suitable for industrial cultivation; there should be more research done to develop mass cultivation methods, ways to spread entomophages, and to select useful microorganisms. Science and production are in need of new express methods for evaluating the resistance of plants to pests and diseases. Continued work should be done to find promising resistance donors, to develop a strategy for replacing varieties, and there should be continued clarification of economic thresholds for the damage caused by organisms in various soil and climatic zones, and so on.

Successful resolution of these tasks is possible through the joint work of specialists in different fields. Further improvement in all the elements comprising the combined systems will make it possible to resolve the basic problem--guaranteeing protection of the harvest and improving its quality during the cultivation and storage of agricultural crops, and to make significant improvements in the economic indicators of plant-growing.

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FINE-MIST AERIAL SPRAYING OF WHEAT

Moscow ZASHCHITA RASTENIY in Russian No 1, Jan 84 pp 28-29

[Article by M. V. Krasnova, senior scientific associate of the VNIIIPANKh GA [expansion unknown, possibly, an institute, of the Civil Aviation, for design of airplane-attached devices]; M. I. Zazimko, sector chief, E. I. Monastyrnaya, senior scientific associate of the North Caucasus Phytopathology Scientific Research Institute; V. I. Podol'skiy, junior scientific associate; and A. Ye. Shvydko, director of plant protection station]

[Text] The total effect from applying this measure in Stavropol Kray over just two years was about 900,000 rubles. People in the southern oblasts of the RSFSR and in the Ukraine should also be interested in this method.

In a decision issued by the Scientific and Technical Council of the USSR Ministry of Agriculture on 17 June 1980, a recommendation was made to introduce a new process involving low-volume, fine-mist aerial spraying of wheat fields to protect against rust in the southern region of the European part of the USSR; this process was developed at the VNIIIPANKh GA and the North Caucasus Phytopathology Scientific Research Institute. The special feature of the process is the use of a concentrated solution of nitrogen fertilizer as the fungicide carrier, rather than water. This solution has a high hygroscopicity, the result of which is that during aerial spraying the droplets of the working substance do not evaporate for all practical purposes and they settle on the land being treated without any losses. The working substance is a 15 percent suspension of zineb or polycarbacine, prepared in a 50-60 percent aqueous solution mixed with ammonium nitrate and urea (in a 1:1 ratio by weight). To obtain 1000 liters of the suspension, 150 kg of the moistened powder is mixed with 920 liters of the fertilizer solution. By increasing the concentration of the working substance and distributing it more equally on the surface of the plants, the rate of consumption of fungicide using fine-mist spraying is reduced by 25 percent compared to the usual norm (3 kg/hectare instead of 4).

The suspension of fungicides, prepared in the fertilizer solution, has a neutral or mildly alkaline reaction and it retains its physico-chemical and fungicidal properties for a long period of time (long-term storage can cause corrosion of metal containers). The maximum volume of the suspension carried in the tank of the sprayer airplane should not exceed 900 liters because of the high density of the mixture (1.28 g/cm³).

The fine spray (the size of the droplets is 150-200 μm and is one-third the usual size) is created by centrifugal atomizers designed at the VNIIIPANKH GA with a spray opening 3 mm in diameter, or by standard slotted sprayers with a cross-section measuring 2 x 5 mm, installed on a serial spraying apparatus. The An-2 airplane should be equipped with a pump with an ejection device for drawing off the working fluid. One cannot use a spraying apparatus with an OZh-2 adaptation for valveless cut-off of the working liquid. The prescribed consumption of the suspension (20 liters/hectare) is ensured by means of a device on the sprinkler bar of 60-65 centrifugal or 18-20 slotted sprayers. In each case the consumption of the working substance is defined more precisely in a test flight.

The An-2 airplane performs fine-mist, low-volume spraying at a speed of 160 km/h and at an altitude of 5 m; the width of the area covered by the spray is increased from the usual 30 m to 40 m. The maximum permissible wind speed is 4 m/sec.

By reducing the suspension consumption rate (from 50 to 20 liters/hectare) and increasing the width of the path covered, the plane's productivity increases by a factor of 1.8-2.2 (from 400 to 800 hectares per working day). Since the suspension of fungicides prepared in a fertilizer solution does not evaporate rapidly, aerial spraying of fields can be done over the course of an entire day regardless of the temperature and relative humidity. This is an additional reserve for increasing the daily and seasonal output of planes and helicopters.

The first spraying is done with the appearance of critical infection of the fields: 1-2 pustules of brown rust per leaf and 1-2 pustules of stalk rust per stalk. If the spraying is done too late, there may be a sharp drop in its effectiveness. When necessary, the spraying is repeated at intervals of 7-10 days and it is terminated no later than 10 days after the wheat begins forming ears. A single application of anti-rust fungicides is ineffective and economically unsound.

Tests conducted over a period of six years have shown that low-volume aerial spraying of winter wheat is accompanied by a more tangible increase in the harvest than would be expected under ordinary conditions: with moderate disease development (50-60 percent), the harvest was 6-9 and 4-5 quintals per hectare, respectively; with heavy disease development (80-100 percent of the plants were infected), the yield was 12-15 and 7-10 quintals per hectare, respectively. This may be the result not only of improved distribution of the preparation on the plants, and consequently a more effective campaign against rust; it may also be the result of a positive physiological effect exerted on the wheat by the zineb and nitrogen fertilizer mixture. For example, there was an increase in the plants' resistance to hot, dry winds and there was a 30-40 percent rise in the leaves' chlorophyll content. In addition, there was a 2-3 percent increase in the quantity of gluten, and there was an improvement in its quality as well. There was a reduction in the number of plants infected with root mold and blemishes on leaves.

Low-volume spraying of winter wheat with the anti-rust substance was done for the first time over a large area (about 2000 hectares) at the Kolkhoz imeni Kalinin in Kirovskiy rayon, Stavropol Kray, in 1980. In all of the 9 fields

that were treated with zineb using the low-volume aerial spraying, the average yield of the Odessa-51 variety was 28 quintals/hectare, and the average yield of the Bezostaya 1 variety was 31.4 quintals/hectare. In the control fields, where zineb was not used, the yields were 22.9 and 28.1 quintals/hectare, respectively. The spraying was done twice at a cost of 12 rubles/hectare and the net income per hectare was 16.3-24.7 rubles.

In Stavropol Kray in 1981-1982, the new method was used on over 40,000 hectares of land planted with winter wheat, with a total economic effect of about 900,000 rubles. In 1982 in Kustanay Oblast (Kustanayskiy rayon), the low-volume spraying method was used to protect 5000 hectares of wheat. Unfortunately, however, in large grain-growing regions of the country, such as the southern RSFSR and the Ukraine, anti-rust aerial spraying is not planned, even on an experimental basis. The low-volume spraying method, which makes it possible to combine in one operation both anti-rust protection and superficial application of additional nitrogen fertilizers, does the best job of meeting contemporary demands for high economic effectiveness and productivity.

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PLANT PROTECTION MEANS FOR PRIVATE SUBSIDIARY FARMS

Moscow ZASHCHITA RASTENIY in Russian No 1, Jan 84 pp 53-55

[Text] Hundreds of chemical preparations and dozens of biological preparations for plant protection are utilized with great success in our country's agriculture. Qualified specialists monitor the use of these substances. Only the safest pesticides are approved for use in private subsidiary farms. Industry produces about 35 chemical and biological substances for sale to the public. In order to prevent these preparations from having any harmful effects on humans and the environment, they undergo thorough toxicological and hygienic testing, and only after they are approved by the USSR Ministry of Health can they be included in the "list of chemical and biological substances used to combat plant pests and diseases, weeds, and parasites of domestic animals and bees, approved for retail sale to the public." Every two years this list is clarified and reviewed.

The Current Assortment of Chemical and Biological Means of Plant Protection for Sale to the Public

Name of preparation, its purpose, and regulations for use	Standard amount used, grams per 10 liters of water	Maximum number of applications	Time of last applica- tion, days prior to harvest
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Insectoacaricides and Molluscicides

Benzophosphate,
trichlorol-5
(92 percent mineral
oil and 5 percent
trichlormetaphosphate).
For combatting a group
of pests, from the first
opening of the buds to
the appearance of
blossoms on: apple,
pear, cherry-plum,
apricot, cherry, sour-
cherry, quince, and
plum trees.

200-300

1

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Green soap; sprayed during the vegetation period of fruit and berry crops and grape-vines; effective against suctorial pests. 200-400 3 5

Insectophoxim (volaton, 5 percent k. e. [expansion unknown]; sprayed on potato and cabbage plants during the vegetation period; effective against the Colorado potato beetle, cabbage butterfly, moths, and cabbage-worms 100-150 3 20

Carbophos (30 percent k. e.); sprayed during vegetation period against suctorial and leaf-eating pests on:

apple, pear trees	25-30	2	30
plum, sour cherry and cherry trees	25	2	30
currants, gooseberries	25	2	30
strawberries, raspberries*	25	2	--
grapevines	25-30	2	45
citrus trees, tea	30	2	50
cabbage, cucumbers and tomatoes	20	2	30
hothouse cucumbers and tomatoes	20	3	3
beets, sugarbeets	20	2	30
watermelon, melons	20	2	20

Keltan (20 percent k. e.); sprayed during vegetation period against ticks on:

cucumbers, tomatoes, melons, watermelon, and other vegetable crops grown outdoors	20	2	20
hothouse cucumbers and tomatoes	20	2	4

*Spraying is permitted only before flowering and after fruit has been picked

apple, pear, and plum trees	20	2	20
grapevines	40	2	30
citrus trees	40	2	30
currants, gooseberries	20	1	30
strawberries, raspberries* strawberries, raspberries*	20	2	--
Kolorcide, dibromo (10 percent k. e.); used against the Colorado potato beetle	70-140	4	20
Metaldehyde (5 percent granular material); used to treat the paths between crops rows against slugs that damage vegetables, fruits, grapes, citrus and flower crops; granules are spread (30-40 g/10 m ²) over surface of soil.	--	2	20
Preparations 30, 30C, 30CC, and 30M (76 percent mineral oil emulsion); sprayed in the spring before buds appear, at temperatures no lower than +4°, to protect against suctorial and leaf-eating pests on: apple, pear, sour cherry, and plum trees	300-400	1	--
ornamental trees and shrubs	400	1	--
gooseberries, currants, raspberries	300	1	--
grapevines	400	1	--
early spring application on citrus trees in relatively dormant phase	300-400	1	--
summer spraying when first and second generation migrant beetles first appear on: apple, pear, and ornamental trees	200-250	2	7
Ground sulfur (powder); dusting of all crops (except gooseberries)			

during vegetation period against ticks	--	5	1
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Triphos, trichlormetaphos-3 (10 percent k. e.); sprayed on:			
apple, pear trees	50-100	2	30
plum, sour cherry trees	50-100	2	30
currants, gooseberries*	50-100	1	--
cabbage, cucumbers, tomatoes	50-100	2	30

Trichlormetaphos-3 (50 percent k. e.); used during vegetation period against suctorial and leaf-eating pests and apple and pear worms on:			
apple, pear trees	10-20	2	30
plum, sour cherry trees	10-20	2	30
currants, gooseberries*	10-20	1	--
cabbage, cucumbers, tomatoes	10-20	2	30

Tsvetofos (a preparation
in aerosol container,
contains carbophos); used
to protect ornamental and
berries bushes, fruit trees
and flowers from aphids,
thrips, ticks, and other
pests in hothouses, forcing
beds, and in open-air beds.
The preparation is sprayed
at a distance of no less than
50 cm. The plant should be
covered with a light mist,
but should not become wet.
When necessary, the treat-
ment is repeated after
10-14 days.

Insectofungicides and Acarofungicides

Nitrophen (60 percent paste); sprayed in the early spring before buds open; used against pests and diseases in dormant stage on:			
apple, pear, sour cherry, plum trees, grapevines	200-300	1	--

gooseberries, currants			
raspberries	200	1	--
strawberries (before spring growth begins)	200	1	--
Colloid sulfur (70 per- cent paste, dispersed; 80 percent s. p. [ex- pansion unknown]).			
Sprayed on all crops (except gooseberries):			
against ticks	50-100	5	1
against mildew	30-80	5	1

Fungicides

Bordeaux mixture (copper sulfate and unslaked lime. Early spring spraying before and during the blossoming of buds on apple and pear trees, against scab and moniliasis fungi; on grapevines against mildew; and on berry bushes against leaf spot; Sprayed on plants during vegetation period: apple and pear trees against scab, moniliasis and phyllostictosis plum, sour cherry, and cherry trees, against clasterosporioses, cocco mycosis, and moniliasis grapevines against mildew and anthracnose currants, gooseberries against anthracnose and septorio sis raspberries, strawberries* potatoes, tomatoes, against phytofluorosis cucumbers, melons, onions	300 g copper sulfate and 400 g unslaked lime 100 g copper sulfate and 100 g unslaked lime same as above same as above	1 -- 6 6 4 6 3 2 4 3	15 15 15 15 15 15 15 15
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Iron Sulfate (53 percent,
powder); sprayed before and
after vegetation period
against mosses, lichens,
and often against fungal

diseases on:

sunflowers and grapevines	500	2	--
drupaceous fruits and berries	300	2	--

Copper Sulfate. For preparing bordeaux mixture; sprayed in the early spring before buds open, against fungal diseases of fruits and berries 50-100

1 --

For disinfecting wounds in fruit trees, 2-3 percent solution.

For disinfecting roots of seedlings after removal of root bacterial cancer tumors; the roots are immersed for 2-3 min in a 1 percent solution. They must then be rinsed with water.

Polycarbacin (70 percent s. p.); sprayed during vegetation period on:

apple, pear trees against scab, moniliasis	40	6	20
grapevines against mildew, anthracnose	40	6	20
potatoes and tomatoes against phytofluorosis, macrosporiosis	40	4	20
wheat against brown, yellow, and stalk rust	40	2	20
sugar beets against peronosporosis, cercosporosis, rust	40	2	20
tobacco, makhorka against peronosporosis	40	2	20
onion against peronosporosis (must not be applied directly to green part of onion)	40	2	20

Polikhom (80 percent s. p.); sprayed during vegetation period on:

apple, pear trees against scab	40	6	20
potatoes against phytofluorosis	40	5	20
tomatoes against phyto-			

flurosis and brown leaf			
spot	40	2	20
grapevines against mildew	40	6	20

Fungicide (disodium phosphate); used to combat mildew on:

cucumbers, squash, water-melon, melons, pumpkins	50	3	20
fruit trees, berry bushes, grapevines	100	3	20
ornamental plants	75	3	20

Copper Oxychloride (90 percent s. p.); sprayed during vegetation period on:

apple, pear trees against scab, moniliasis	30-40	6	20
plum, peach, cherry, apricot, sour cherry trees against clasterosporiosis, cocomycosis, curly top	30-40	4	20
grapevines against mildew, anthracnose	40	6	20
potatoes against phyto-flurosis, macrosporiosis	40	5	20
tomatoes against phyto-flurosis	40	4	20
onions, cucumbers against poronosporosis	40	3	20

Herbicides

Dichlorourea (50 percent s. p.); used to combat annual grass and dicotyledonous weeds:

on beets (regular eating beets, sugar and feed beets) the soil is sprayed in the spring, before planting, during planting, or before the first shoots appear; with tobacco, this herbicide can be used only before the seedling is transplanted

160	1	--
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Propionate (dalapon, 85 percent dissolved powder); used to combat creeping couch grass. Directed

spraying is permitted on vegetative weeds in orchards (at least 3-4 years old), in vineyards and berry bushes. One should avoid spraying the crop plants.	100	2	30
Soil can be sprayed in the fall after fruit has been harvested from orchards and berry bushes; the spray can also be used to prepare soil for planting currant, raspberry, gooseberry plants, potatoes, and beets	300	1	--

Attractants

Apple maggot trap; used
to reduce the population
of this pest by catching
the males. The trap
contains glues that retains
its stickiness for a long
time and a sexual
attractant for apple
maggot flies

Oriental fruit moth trap;
used to reduce the population
of the oriental fruit moth,
which damages peaches, quinces,
apricots, etc., by catching and
destroying the males.
Both types of traps are hung on
peripheral branches at the crown
of the tree at a height of
1.5-2 m at the end of the tree's
flowering period (2 traps per 100 m^2)

Biological Means

Dendrobacillin (dry
powder); sprayed on
fruit crops at 8-10 day
intervals against 2-3
ages of larvae of apple
and fruit moths, loopers,
pierid butterflies, golden
nematodes, silkworms,
and the American white

moth.	60-100	2	5
Sprayed on vegetable crops at 8-10 day intervals against 1-3 ages of larvae of the cabbage moth, and turnip and cabbage butterfly	20-60	2	5
Entobacterin (dry powder). Sprayed on fruit crops at 8-12 day intervals against 1-2 ages of larvae of apple and fruit moths, silkworms, loopers, golden nematodes, pierid butterflies, and the American white moth.	60-100	2	5
Sprayed on vegetable crops at 8-12 day intervals against 1-3 ages of larvae of the cabbage moth, and the turnip and cabbage butterflies	20-60	2	5

Chemical Substances for Plant Care

Orchard pitch (petrolatum); smeared on wounds made in fruit trees when cutting twigs and grafts

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Water-emulsion paint VS-511 (emulsion); used to protect fruit, ornamental, and other trees from being burned by the sun and from damage by rodents during the winter; spread on tree wounds (has a disinfectant effect)

"Zashchita" [Protection] (emulsion); prevents burning by the sun and damage by rodents.

Orchard whitewash (powder); protects tree trunks from damage.

Smoke cartridges (powdery mixture); for protecting flowering fruit orchards and garden plants grown outdoors against the effects of low temperatures during spring and fall frosts.

Orchard putty (a sticky substance); used to protect cut tree trunks against sap loss and drying out.

Orchard glue (a sticky glue-like substance); used in the fall to destroy dormant pests (the ringed silkworm) and in the spring against flower-eating pests on fruit trees (weevils).

Slaked lime (powder); to whiten tree trunks and skeletal branches and to prepare bordeaux mixture

Chemical and biological means of plant protection (except for those that do not contain any poisonous active substances and that do not have any prescribed time for final application) should be used only when there is a significantly high incidence of pests, plant disease, or weeds. When using pesticides it is essential that safety procedures be followed, in addition to application instructions, the prescribed time for final application, the rate of consumption, and regulations, such as maximum number of applications.

The following rates of consumption of the working substance have been established for spraying fruit and vegetable crops:

Pesticides

Young trees (up to 6 years)	up to 2 l per tree
Fruit-bearing trees	up to 10 l per tree
Currant bushes	up to 1.5 l per bush
Gooseberry bushes	up to 1 l per bush
Raspberry bushes	up to 2 l per bush
Strawberry plants	up to 1.5 l per 10 m^2
Grapevines	up to 1.5 l per 10 m^2
Citrus trees	up to 5 l per tree
Vegetables, melons, grains, potatoes, sugar beets	up to 2 l per 10 m^2

Hothouse cucumbers and tomatoes
Hops

up to 2 l per 10 m²
up to 2 l per 10 m²

Herbicides

up to 0.5 l per 10 m²

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9967

CSO: 1840/1028

UDC 631.811.3:58.035:633.11:633.15

POTASSIUM NUTRITION OF SPRING WHEAT AND CORN AS A FUNCTION OF LIGHTING CONDITIONS

Moscow AGROKHIMIYA in Russian No 3, Mar 84 (manuscript received 21 Mar 83)
pp 18-26

KUPERMAN, I. A. and KHITROVO, Ye. V., Institute of Soil Cultivation and Agrochemistry, Siberian Department of USSR Academy of Sciences, Novosibirsk

[Abstract] The relationship between requirements for potassium and the degree of illumination was studied on a model, using artificial illumination of wheat, and under field conditions, using corn planted at different thickness. Utilization of potassium was found to be more efficient in full light than in darkness. To obtain a biomass equivalent to plants exposed to light, the shaded specimens required higher K concentration in the nutritional substrate. With diminished lighting, compensatory mechanisms of potassium redistribution are activated; these mechanisms need further studies. With adequate lighting potassium deficiency limits the ability of plants to utilize carbohydrates rather than to synthesize them. With light deficiency the limitation of accumulating carbohydrates becomes more important. Since under such conditions the root system is also less efficient in extracting potassium from soil, its concentration in soil must be increased. Figures 3; references 30: 13 Russian, 17 Western.
[1039-7813]

UDC 543.31

SYSTEM OF MEASURES DESIGNED TO PROTECT WATER OBJECTS FROM POLLUTION WITH AGRICULTURAL CHEMICALS

Moscow AGROKHIMIYA in Russian No 3, Mar 84 (manuscript received 17 Mar 83)
pp 61-65

PASTERNAK, P. S., PRIKHOD'KO, N. N., MATUKHNO, Yu. D. and LANDIN, V. P., Carpathian Branch of Ukrainian Scientific Research Institute of Forestry and Agro-forestry Reclamation, Ivano-Frankovsk

[Abstract] Intensified agricultural productivity has led to the problem of protection of water reservoirs from agricultural chemicals. Run-off waters carry with them fertilizers, pesticides, microorganisms and organic chemicals leading to silt formations in fresh water basins. Ecological results of the change in chemical composition of water leads to disturbances in hydrocarbon,

nitrogen and phosphorus cycles, lowered bioproduction and even mutagenic and carcinogenic transformations. Because chemical use is going to continue, measures must be developed for protection of water resources. Effective protection of water must be based on lowering the concentration of chemicals in run-off waters. Therefore, it is necessary to introduce special water protecting systems aimed at regulation and purification of surface run-off. Run-off depends on topography, climate, soil, vegetation and on human activity. This paper stresses planned forestry as the most effective means of preserving clean streams and rivers. References 13 (Russian).
[1039-7813]

UDC 546.15:539.163

ROLE OF SOIL PROPERTIES, INTERSPECIES DIFFERENCES OF PLANTS AND OTHER FACTORS IN ACCUMULATION OF RADIOACTIVE IODINE BY AGRICULTURAL CROPS

Moscow AGROKHIMIYA in Russian No 3, Mar 84 (manuscript received 14 Mar 83)
pp 77-82

MOISEYEV, I. T., TIKHOMIROV, F. A., PEREVEZENTSEV, V. M. and RERIKH, L. A.,
Moscow State University

[Abstract] Results were reported of laboratory and vegetative experiments evaluating the introduction of radioactive iodine into agricultural plants as a function of soil properties, plant species, fertilization, etc. Incubation of ^{125}I in soil for 30 days showed that the highest content of water soluble radionuclide (30%) was found in alluvial-layered sandy soils and soils with low content of humus. The smallest content was in chernozem and in red soil (12-18%). This was paralleled by the highest coefficient of accumulation (K_a) of ^{125}I in peas. Lowest K_a were manifested in oat grain and in peas. The highest K_a was in pea leaves. Addition of peat to the soil lowered ^{125}I introduction into germinating plants. Addition of NPK and calcium carbonate differed in their effect from soil to soil. References 11 (Russian).
[1039-7813]

UDC 632.954

SORPTION OF HERBICIDES BY PRINCIPAL SOIL COMPONENTS. 5 COMMUNICATION.
DEPENDENCE OF HERBICIDE ACTIVITY OF PYCLORAM ON ITS CONCENTRATION IN SOIL
IN FREE STATE

Moscow AGROKHIMIYA in Russian No 3, Mar 84 (manuscript received 16 Jun 83)
pp 83-86

SPIRIDONOV, Yu. Ya., SHESTAKOV, V. G., MATVEYEV, Yu. M. and SPIRIDONOVA, G. S.,
All-Union Scientific Research Institute of Phytopathology, Moscow Oblast

[Abstract] Many mathematical models were developed describing behavior of pesticides in soil. However, they were based on multiple regression analyses,

included many coefficients showing no physical sense. Other models based on some universal equation, for example, equation of material balance make more sense, since they describe summary effects of elementary physical-chemical phenomena. An equation is proposed for concurrent convective and diffusion transfer of substances based on continuity of their relocation in soil. Following theoretical analysis, vegetational experiments showed that with increased concentration of non-adsorbed pycloram in soil, independent of its type, an equivalent increase of its physiological activity takes place. Figures 2; references 14: 11 Russian, 3 Western.
[1039-7813]

UDC 632.951

DEGRADATION OF INSECTICIDES IN PLANTS GROWN IN COVERED GROUND AND THEIR TOXICITY TOWARDS PESTS

Moscow AGROKHIMIYA in Russian No 3, Mar 84 (manuscript received 18 May 83)
pp 87-90

PETROVA, T. M., KORNILOV, V. G. and KRASNIKOVA, N. G., All Union Institute of Grain Cultivation, Pushkin

[Abstract] Control of harmful arthropoda in hot houses is difficult because they reproduce rather rapidly (3-20 generations per year), they feed on many cultures and they develop rapid resistance to a given agent. The use of chemical agents is complicated because the vegetables are harvested at a rapid rate and quickly reach the customer. In order to define most rational and economic utilization of chemicals in hot houses, behavior of most-promising agents was studied under conditions prevailing in hot houses along with their toxicity towards various pests. The action of organophosphorus agents (actellic, volaton, carbophos), nitrogen containing (acrex) and pyrethroid preparations (ambush, ripcord) on cucumber and tomato pests was investigated. Organophosphorus insecticides broke down within a week in the plants' leaves; volaton could not be detected after 5 days, carbophos--after eight; and actellic's level after 10 days was 0.01 mg/kg. On tomatoes, traces of organophosphorus preparations were noted 5 days post-treatment, disappearing completely in 10 days. Organophosphorus insecticides decomposed more rapidly in plastic-covered hot houses, pyrethrins broke down faster in glassed buildings.
Figures 2; references 9: 6 Russian, 3 Western (1 by Russian author).
[1039-7813]

ED₅₀ CALCULATION METHOD FOR HERBICIDES AND DEFOLIANTS

Moscow AGROKHIMIYA in Russian No 3, Mar 84 (manuscript received 22 Jun 83)
pp 91-93

MEL'NIKOVA, I. A., KOZLOVA, T. F., VOLKOVITSKIY, V. N., KLOCHKOVA, V. A.,
DUBOVA, Ye. F. and GRYSLOVA, O. V.

[Abstract] Usual methods of determining ED₅₀ are based on dose-effect evaluation of 4-5 pairs of values. A new method is proposed for ED₅₀ of herbicides, arboricides and defoliants based on a single value regardless of experimental conditions and type of the biological object studied. The method is based on generalized linear equation obtained from literature data by means of regression analysis:

$$P = a + b \lg \frac{\frac{ED}{r}}{ED_{50}}$$

where P = phytotoxic effect expressed in probits, ED_r = dose causing effect P, a and b = equation parameters. To obtain starting data for each of above classes, more than 100 papers published in 1970-1980 period were analyzed. The proposed method can be used in the 21-80% interval of the phytotoxic effect to calculate ED₅₀ of herbicides, arboricides and defoliants. References 10: 5 Russian, 5 Western.
[1039-7813]

CONDITIONS FOR MICROBIAL DEGRADATION OF PESTICIDES

Moscow AGROKHIMIYA in Russian No 3, Mar 84 pp 105-119

GOLOVLEVA, L. A. and FINKEL'SHTEYN, Z. I.

[Abstract] This review notes that introduction of large quantities of pesticides, growth regulators and industrial waste products may lead to contamination of large areas far beyond the area of application. Breakdown of residual chemicals occurs by biological or abiogenic action. Microbial agents are excellent degradation agents. Under natural conditions many of these chemicals break down very slowly because of inadequate conditions. The review covers the following topics: pesticide susceptibility to control by microorganisms as a function of their chemical structure; effect of sorptional processes in the soil on biodegradation of pesticides; effect of organic substances on microbial degradation of pesticides; effect of temperature, pH and aeration on pesticide breakdown by soil microflora; and cumulative action of microorganisms. Microorganisms are potentially very promising control agents against the residual action of pesticides. More attention needs to be paid to detailed studies of ecological regularities of the breakdown under strictly controlled

conditions which are nevertheless close to the natural situation. More attention must be paid to studies of the effect of the medium on pesticide degradation. Figures 3; references 146: 26 Russian, 120 Western.
[1039-7813]

UDC 631.84:633.11"321"(571.1/.5)

PREDICTION OF SPRING WHEAT RESPONSIVENESS TO NITROGEN FERTILIZERS IN SIBERIA

Moscow AGROKHIMIYA in Russian No 1, Jan 84 (manuscript received 11 Jul 83)
pp 3-8

ANIKST, D. M., All-Union Research Institute of Fertilizers and Agronomical Soil Science

[Abstract] A mathematical analysis was performed on the correlation between spring wheat harvests and nitrogen supply in the grey and chernozem soils of Siberia and the Transurals. The results of 22 field trials demonstrated that application of nitrogen fertilizer in a dose of 60 kg/ha, in combination with P40-60K40-60, resulted in harvest gains that fell into weakly effective (<3 centners/ha), moderately effective (3-6 centners/ha) and highly effective (>6 centners/ha) categories. Under appropriate conditions of temperature and moisture, the nitrogen fertilizer could account for 65% of the harvest gain. Regression equations for the effectiveness of nitrogen application were derived, and correlation coefficients calculated and tabulated for the relationship of soil nitrogen content, temperature and precipitation to spring wheat harvests. References 38 (Russian).

[1040-12172]

UDC 631.85

FORM FACTORS IN EFFECTIVENESS OF PHOSPHORUS FERTILIZERS IN PERENNIAL TRIALS

Moscow AGROKHIMIYA in Russian No 1, Jan 84 (manuscript received 21 Feb 83)
pp 17-23

BEZUGLAYA, Yu. M., KOZHEMYACHKO, Z. V. and RYABIZINA, T. YE., Scientific Institute of Fertilizers and Insectofungicides, Moscow

[Abstract] Long-term studies were conducted on dervnovopodzolic loamy soil to determine the effects of different phosphates in crop rotations. Studies with rotations involving vetch (12 years), oats (12 years), winter wheat (16 years), potatoes (17 years) and barley (15 years) showed that water- and citric acid-soluble phosphorus fertilizers were equally effective on limed soil. However, on unlimed soil the citric acid-soluble fertilizer was more effective with respect to crops sensitive to soil acidity (winter wheat, barley), giving an 82% increase in harvest over a 16-year period in comparison with NK (versus a 62% increase for the water-soluble fertilizer). Phosphorite fertilizer was inferior to other forms on unlimed soil during the first rotation, but equivalent to the water- and citrate-soluble phosphates in rotations II to IV without

liming. The overall increment in harvest due to use of phosphorite fertilizer during the four rotations was 60% in comparison with NK alone. Side-by-side comparisons with the effects of granulated superphosphate allowed for evaluation of the degree to which the various combinations are more effective than a given single form. References 3 (Russian).
[1040-12172]

UDC 631.859.412

PHYSICAL PROPERTIES OF DEHYDRATED CALCIUM PHOSPHATES FROM KARATAU PHOSPHORITES

Moscow AGROKHIMIYA in Russian No 1, Jan 84 (manuscript received 15 Feb 83)
pp 24-29

MALONOSOV, N. L., ZAVERTYAYEVA, T. I., KAGRAMANCOVA, V. A. and V'YUGINA, T. A., Scientific Institute of Fertilizers and Insectofungicides, Moscow

[Abstract] The physical and mechanical properties of dehydrated calcium phosphate (CP), prepared from Karatau phosphorites by decomposition with phosphoric acid or phosphoric acid/sulfuric acid combination, drying (280-300°C) and granulation, was evaluated for granular stability, hygroscopic characteristics, caking, and friability in relation to storage and manufacturing conditions. The studies revealed that caking occurs only on prolonged storage (more than 3 months) in standard packing bags, with exposure to a relative humidity of 50-60% or greater when the background moisture content is low (0.1-0.2%). Caking is a significant problem when the product contains more than 3% hygroscopic water. For long-term storage with retention of desirable physical characteristics CP should be dispensed in tared polyethylene or laminated paper bags. Figures 3; references 5 (Russian).
[1040-12172]

UDC 632.954:633.11

EFFECTS OF MULTICOMPONENT MIXTURES OF GROWTH INHIBITORS AND HERBICIDES ON QUALITY OF WINTER WHEAT HARVEST

Moscow AGROKHIMIYA in Russian No 1, Jan 84 (manuscript received 18 Feb 83)
pp 61-68

GRUZDEV, L. G. and NENAYDENKO, G. N., VNIPTIK [expansion unknown], Moscow; Ivanovo Agricultural Institute

[Abstract] Long-term (1971-1980) studies were conducted on the effects of multicomponent mixtures of growth inhibitors (hidrel, dihidrel, CCC, etc.) and herbicides on winter wheat harvest and grain quality in the central non-chernozem zone. (2-chloroethyl)-phosphonic acid derivatives (hidrel, dihidrel) were effective in the case of Mironovskaya 808 wheat in preventing lodging,

hidrel in doses of 1-1.5 kg/ha and dihidrel in doses of 0.5-1.0 kg/ha. Combination of CCC (chlorocholine chloride), hidrel or dihidrel with herbicides for weed control reduced the required doses by 15-30%. The effects were particularly noticeable in combination with nitrogen and trace element fertilizers (copper, cobalt, zinc). Such combination improved the harvests by 3-10 centners/ha, with the higher increments predominating in years with adverse climatic conditions. Grain quality was also improved by such combinations as reflected in the increase in weight, essential amino acid content, protein concentration and gluten levels. Figures 3; references 24: 23 Russian, 1 Western.

[1040-12172]

UDC 631.841.7

N-PHENYL-N'-(1,2,3-THIADIAZOL-5-YL)UREA: DEFOLIATING EFFECTS AND MODIFICATION OF ETHYLENE RELEASE BY COTTON LEAVES

Moscow AGROKHIMIYA in Russian No 1, Jan 84 (manuscript received 29 Mar 83) pp 69-73

ZUBKOVA, N. F., BUKASHKINA, Z. V. GRUZINSKAYA, N. A. and SHEKHTMAN, L. M., VNIIKhSZR [expansion unknown - possibly, All-Union Scientific Research Institute of Chemicalization of Agricultural Plants?], Moscow

[Abstract] An assessment was made of the mechanism of action of the defoliant activity of N-phenyl-N'-(1,2,3-thiadiazol-5-yl)urea (PTDU) by correlating the former with ethylene production by the leaves of two cotton species (*Gossypium hirsutum* and *G. barbadense*). Spraying with 0.01-0.00001% solutions demonstrated that *G. barbadense* was the more susceptible species (0.00001%) than *G. hirsutum* (0.001-0.01%) to defoliation. In both cases the effects of PTDU were correlated with the degree of ethylene production, and suggested that stimulation of ethylene production represented the mechanism of defoliant action of PTDU. The effects of PTDU were abolished by lowering the temperature to 16°C from 25°C, which was concomitant with a reduction in ethylene production.

References 12: 3 Russian, 9 Western.

[1040-12172]

UDC 543.2:631.85

DETERMINATION OF ASSIMILABLE PHOSPHATES IN SUPERPHOS FERTILIZERS

Moscow AGROKHIMIYA in Russian No 1, Jan 84 (manuscript received 11 May 83) pp 81-83

LEVSHINA, A. A., ZAYTSEV, P. M., ZAVERTYAYEVA, T. I. and SAVCHENKO, Ye. N., Scientific Institute of Fertilizers and Insectofungicides, Moscow

[Abstract] Details are described for the assessment of the long- and short-acting forms of phosphorus in the various superphos fertilizers, and on

recovery conditions for total assimilable phosphate. On extraction with 0.2 M EDTA the recovery of assimilable phosphate (P_2O_5) from superphos increases with time and reaches a maximum plateau within seven to fourteen days, which is equivalent to the total phosphorus concentration. Data is presented on other forms of extraction and their efficiency in relation to site of origin of the superphos. Since the EDTA method is not applicable in analytical quality control, the recommended method calls for extraction and determination of total P_2O_5 which is equivalent to assimilable form of P_2O_5 . Figures 1; references 3 (Russian).
[1040-12172]

UDC 632.951

PYRETHROID TOXICITY FOR USEFUL ARTHROPODS

Moscow AGROKHIMIYA in Russian No 1, Jan 84 pp 129-137

YEREMINA, O. Yu.

[Abstract] A literature review is presented on the toxicity of various pyrethroids for arthropods that are useful in the biological control of phytophagous species, and for such commercially valuable species as bees. Tabular data are presented for the individual insecticides which cover the coefficient of selectivity, susceptibility and contact toxicity for the different species. Such information is particularly pertinent in view of the increasing use of the synthetic pyrethroids on a global scale. References 32: 1 Rumanian, 5 Russian, 26 Western.
[1040-12172]

UDC 631.85:633.11:631.445.4(574.21)

EFFECTS OF PHOSPHORUS DOSE UNDER FIRST WHEAT CROP IN COMMON CHERNOZEM OF KUSTANAY OBLAST

Moscow AGROKHIMIYA in Russian No 12, Dec 83 (manuscript received 1 Nov 82)
pp 20-23

KOLSANOV, G. V., SAZONTOVA, G. K. and KOLSANOVA, N. I., Kustanay Agricultural Institute

[Abstract] The effects of superphosphate dose under the first wheat crop in rotation was evaluated over a period of four years (1976-1979) on the low-humus chernozem of the Kustanay Oblast of Northern Kazakhstan. The results showed that all forms of phosphorus (P50, P100, P150) resulted in a significant increase in the harvest of the first wheat (Saratovskaya-29) crop (2.0-2.5 centners/ha), but that the results with P100 and P150 doses were not significantly better than with P50. In addition, use of the phosphorus fertilizer had no telling effect on the quality of the grain. Addition of the phosphorus fertilizer also enhanced plant uptake of nitrogen and potassium from the soil

by 15-25%, an effect which was dose-related to the phosphorus. Uptake of phosphorus by the first wheat crop, however, was relatively low and largely dose-dependent. References 3 (Russian).

[1042-12172]

UDC 631.85:633.511

EFFECTS AND SEQUELAE OF INCREASING PHOSPHORUS DOSES ON COTTON

Moscow AGROKHIMIYA in Russian No 12, Dec 83 (manuscript received 20 Sep 82)
pp 24-27

RAZYKOV, K. M., CHANDERA, D. and LEONOVA, A. G., SoyuzNIKhI [expansion unknown, possibly, Scientific Research Cotton Institute Union], Tashkent Oblast

[Abstract] Laboratory studies were conducted with sierozem obtained from Central Asian virgin lands to determine the effects of super phosphate fertilizer dose on Tashkent-1 cotton harvest. On soils containing 6.5 mg/kg of soluble phosphorus, addition of 6 or 9 gm of superphosphate per jar containing 23 gm of the soil resulted in maximum harvests, over a three year period covering four crops, while 3 gm of P_2O_5 was inadequate for such long-term effects. However, for the first crop 3 gm of superphosphate yielded the maximum harvest, with higher doses (6-900 gm) failing to improve on the yield. Addition of superphosphate to the phosphorus-poor soil also normalized the N:P₂O₅ ratio (optimum at 1:0.30) over the three year period after a single application. Excess application of superphosphate also accumulated in the plant tissue, but in a metabolically inert mineral form and had no effect on the harvest. References 3 (Russian).

[1042-12172]

UDC 631.445.4:631.416.2:631.417:631.67(470.324)

EFFECT OF IRRIGATION ON PHOSPHATE FORMS IN CHERNOZEMS OF VORONEZH OBLAST

Moscow AGROKHIMIYA in Russian No 12, Dec 83 (manuscript received 4 Feb 83)
pp 28-32

KOROLEV, V. A., KOROLEVA, G. V. and GALASHEVA, O. Ye., Voronezh State University

[Abstract] An analysis was conducted on the forms of phosphate in the chernozem soils of the Voronezh Oblast used for alfalfa cultivation in the period 1979-1980 in relation to irrigation. During that time fertilizers were not employed. Determination of the phosphate forms by the method of Chirikov showed that the form composition of phosphates in the soil was little affected. In general, the content of group II phosphates was diminished, while that of groups III and IV increased by the use of irrigation. Groups I and V phosphates, as well as total phosphate, remained virtually unchanged. These

observations led to the recommendation that irrigated, common chernozems should be fertilized with granulated forms of superphosphate, applied in small but frequent doses. References 8 (Russian).
[1042-12172]

UDC 631.879.2

LEATHER PROCESSING PLANT EFFLUENT SEDIMENT AS FERTILIZER

Moscow AGROKHIMIYA in Russian No 12, Dec 83 (manuscript received 10 Dec 82)
pp 69-73

DEGODYUK, E. G., SHTUPUN, N. V., PROSKURA, Z. V., KUKHARCHUK, P. I.,
KOLOBOVA, M. L. and LEONCHIK, O. A., Ukrainian Scientific Research Institute
of Agriculture, Kiev Oblast

[Abstract] The potential use of the sediment derived from the effluent of the Kiev Leather Processing Plant as a fertilizer was investigated on drenovo-podzolic soil under a variety of crops (potatoes, corn, barley, winter wheat, etc.). The use of the sediment as a fertilizer and liming agent was based on its composition, which includes organic substances, nitrogen, phosphorus, calcium, chromium and other elements. Maximum effects were obtained with the use of 20-30 tons/ha of the sediment, with the most beneficial effects shown by plants that respond well to liming. Higher doses were ineffective because of the increase in the chromium content of the soil. The Cr increase in the soil by 70% and in plant samples by 24-35%; however, the total chromium content of the soil and the crops remained low (23-27 mg/kg and 0.2-3.0 mg/kg dry substance, respectively) in comparison with common background levels of 20-200 and 1-32 mg/kg, respectively. In view of the negative effects of high chromium levels on plants and in the interest of environmental protection, measures will have to be taken to limit the amount of chromium in the effluent of the leather plant. References 10 (Russian).
[1042-12172]

UDC 631.98

EFFECTS OF HIDREL AND DIHIDREL ON GROWTH, PRODUCTIVITY AND FROST-RESISTANCE OF GREENHOUSE CUCUMBERS

Moscow AGROKHIMIYA in Russian No 12, Dec 83 (manuscript received 17 Mar 83)
pp 85-89

BUDYKINA, N. P., VOLKOVA, R. I., DOZDOV, S. N., ZUBKOVA, N. F. and
PRUSAKOVA, L. D., Institute of Biology, Karelian Branch of the USSR Academy
of Sciences, Petrozavodsk

[Abstract] Two derivatives of (2-chloroethyl)phosphonic acid, hidrel and dihidrel, were tested for their effects on the productivity, growth and cold-resistance of cucumbers (Din-zo-sn and Teplichnyy ranniy 65 varieties) grown under greenhouse conditions. The studies showed that spraying with both preparations at low doses (0.1-0.5 gm/liter) had generally similar effects in that

frost-resistance was enhanced, lengthwise growth of the stem was inhibited to yield sturdier plants, and formation of generative organs was enhanced with preferable formation of female flowers (200-300% in comparison with control cultures). During the first four months of fructification, productivity was increased by 31% (or by 4.5 kg/m²), and over the entire period of vegetation the hidrel and dihidrel treatment raised the harvest by 6.25 kg of cucumbers per square meter. Figures 3; references 12 (Russian).

[1042-12172]

UDC 632.954

3,4-DICHLOROANILINE DYNAMICS IN SOIL AND SOIL SUSPENSIONS

Moscow AGROKHIMIYA in Russian No 12, Dec 83 (manuscript received 17 Jan 83)
pp 100-102

GALIULIN, R. V., Institute of Soil Science and Photosynthesis, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] The fate of 3,4-dichloroaniline (DCA) in soil was investigated by incubating DCA with samples of grey, medium loamy forest soil under different hydrothermal conditions, and subsequent analysis for DCA levels in the soil samples and soil suspension (prepared by centrifugation at 16000 rpm for 30 min). Incubation and analysis over a 16 day period demonstrated that low temperatures (8°C) and high soil moisture content (122%) favor high concentrations of DCA in the soluble fraction. This fact suggests that under such conditions, DCA may accumulate in the soil, migrate with soil water and pose the potential threat of pollution. Analysis of soil suspensions, therefore, represents an approach toward the evaluation of the degree of persistence of herbicides in the soil and evaluation of a potential environmental hazard. Figures 1; references 11 (Russian).

[1042-12172]

UDC 631.423:546.18

RAPID ASSAY OF TRACE QUANTITIES OF PHOSPHORUS IN ORGANIC SOIL

Moscow AGROKHIMIYA in Russian No 12, Dec 83 (manuscript received 2 Jul 82)
pp 103-104

GANAGO, L. I., ISHCHENKO, N. N. and KHINEVICH, T. V., Institute of Solid State and Semiconductor Physics, Belorussian SSR Academy of Sciences; Scientific Research Institute of Reclamation and Water Management, Minsk

[Abstract] Details are presented on a rapid method for the analysis of soil-phosphorus content which rests on the formation of an ionic association between molybdoanadophosphoric heteropolyacid and crystal violet, and subsequent measurement of the optical density at 590 nm for correlation with a standard curve. The high sensitivity ($\epsilon = 3.10 \times 10^5$) of the method allows high dilutions

(ten-fold and greater) of the organic soil samples and, in combination with a linear standard curve over a 0.1-0.7 $\mu\text{g P}/10 \text{ ml}$, limits the error of determination to 4.1%. Excluding the extraction process, the entire analysis requires only 20 min. References 3: 1 Ukrainian, 2 Russian.
[1042-12172]

UDC 577.175.1

PHYTOHORMONES AND PHYTOTECHNOLOGY: PLANT GROWTH REGULATORS

Moscow AGROKHIMIYA in Russian No 12, Dec 83 pp 105-110

CHAYLAKHYAN, M. Kh.

[Abstract] A literature review is presented of some of the more recent advances in plant growth regulators, both phytohormones and nonhormonal factors. Data on research findings are supplemented with practical applications of such agents in the various climatic regions of the USSR, and the mention that some such agents are now produced on a large scale in the USSR. The First All-Union Conference on Plant Growth and Development Regulators was held in October, 1981, which summarized progress until that time, and even today, the published proceedings serve as a useful source of information. A special program has been developed by the USSR Ministry of Agriculture to promote the use of the growth regulators in Soviet agriculture and provide support for basic and applied studies. References 29 (Russian).
[1042-12172]

UDC 632.954

FATE OF 2,4-D AND OTHER CHLOROPHENOXY ACIDS IN SOIL

Moscow AGROKHIMIYA in Russian No 12, Dec 83 pp 111-123

CHKANIKOV, D. I.

[Abstract] A review is presented of the fate of 2,4-D (2,4-dichlorophenoxy-acetic acid) and related herbicides in the soil. Consideration is given to the physical and chemical soil characteristics that determine the diffusion and migration of 2,4-D in the soil, and the microorganisms that are active in the biodegradation of this and related herbicides. Comparative data are presented on the rates of degradation in the soil of the various phenoxy acids, and the more recent appreciation that the genes determining microbial degradation of these chemicals are located on plasmids. The latter findings suggest the possibility that genetic engineering may be used in the construction of microbial species highly efficient in the elimination of 2,4-D and its congeners from the soil. Figures 4; references 123: 10 Russian, 113 Western.
[1042-12172]

BIOCHEMISTRY

LABELED FATTY ACID PROPOSED FOR MEDICAL MONITORING

Kishinev SOVETSKAYA MOLDAVIYA in Russian 17 Feb 84 p 4

[Text] Dushanbe -- Chemists of Tajikistan have obtained a rare variety of fatty acid into which electron markers have been introduced.

Specialists have called this innovation a substance more valuable than gold. And with good reason--introduced into a living body, molecules of this marked acid open up the possibility of monitoring and studying processes of metabolism, as well as the condition of the body's tiniest particles, such as those which make up the blood or membranes of living cells. Information on the body's predisposition to certain diseases can thus be obtained in good time.

The first steps have been taken toward the introduction of small radio spectrometers into production by industry.

FTD/SNAP
CSO: 1840/603

ENVIRONMENT

ECOLOGICAL PROTECTION OF SEAS

Moscow ECOTASS in English No 45, 5 Dec 83 p 37

[Article]

[Text] A new agent, developed by Soviet specialists, promptly neutralizes an oil film on the water surface. The new agent was launched in mass production by the chemical integrated plant in Estonia, which has offered the agent to ecological services of Soviet major harbors.

In contact with polluted water, the agent "breaks up" an oil layer into small drops, which are oxidized and eaten up by bacteria. Under the impact of the sun, the drops are destroyed, thus opening up air access to the underwater layer.

The development of the novel agent is one instance of the realization of a Long-Term Program of Environmental Control in Soviet water transport, according to a statement to a TASS correspondent by Professor Sergei Dranitsin, Deputy Director of the Central Institute of Merchant Marine in Leningrad. This comprehensive plan foresees the adoption of prompt measures in cases of distress.

To this purpose ships of the "Svetlomor" type are successfully operating in Soviet ports. Apart from their chief function--accepting oil from wrecked tankers--they also fulfill oil cleaning operations before the ship is put on repairs and transport the oil-containing water.

The scientist stressed that an important section in the Program is allotted to measures to prevent potential pollution. To this end all the 1,700 large-tonnage transport ships flying the Soviet flag are equipped with systems of purification of technical and communal waters and rubbish-burning devices. Not a single captain will be issued permission to set out on a voyage without a special ecological certificate guaranteeing the observance of national rules and regulations stipulated by conventions, adopted within the framework of the U.N. International Maritime Organization.

A promising trend in shipbuilding, the scientist said in conclusion, is the construction of tankers with double bottom and sides. Such ships, of the "Pobeda" type, are practically guaranteed against oil spoilage even in case a ship is wrecked or stranded.

UDC 577.170.49+547.915:(582.26/27)

LIPID ABSORPTION AND LUMINESCENCE SPECTRA OF MARINE ALGAE *ULVA FENESTRATA* AND *PELVETIA WRIGHTII*

Moscow OKEANOLOGIYA in Russian Vol 24, No 2, Mar-Apr 84
(manuscript received 19 Jul 82; in final form 13 May 83) pp 337-341

KARYAKIN, A. V., SAYENKO, G. N., BEL'CHEVA, N. N. and KORYAKOVA, M. D.,
Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy,
USSR Academy of Sciences, Moscow; Institute of Chemistry, Far Eastern
Scientific Center, USSR Academy of Sciences, Vladivostok

[Abstract] Studies were conducted on the visible, IR and UV absorption spectra of total lipids and individual lipid fractions derived from the green algae *Ulva fenestrata* (Chlorophyta) and the brown algae *Pelvetia wrightii* (Phaeophyta). Both species were collected from the Sea of Japan in January 1978. The tabulated data for the absorption spectra, in conjunction with fluorescent spectra, show definite differences between the green and brown algae despite the chemical identity of their lipids. Intra- and intermolecular interactions of the functional groups in the green algae are more pronounced than in the lipids of the brown algae and, therefore, have fewer structural features than the latter. In view of this, the lipids of the brown algae possess more free functional groups and, consequently, have a greater capacity for binding metals. Figures 5; references 14: 12 Russian, 2 Western.
[583-12172]

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FOOD TECHNOLOGY

UDC 631.15:338.43.02:639

SOVIET FOOD PROGRAM AND FISHERIES INDUSTRY

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 3, Mar 84, pp 21-28

KAMENTSEV, V., Minister, USSR Fisheries Industry

[Abstract] The Soviet fisheries industry has matured to the point where today it provides more than 20% of the animal protein consumed in the USSR. In view of planned expenditures, it is anticipated that, in the eighties, the productivity of this branch of the Soviet food industry will increase by 5.2-5.3 million tons per year as a result of new vessels being put into service. In addition, plans have also been made to construct research vessels to study the means by which on-board processing can be improved and rendered more efficient. Other studies are being conducted to expand the variety of food products being produced, and to use many marine nutrients as supplements to other foods. In addition to modernization of existing plants on land, new ones are being planned or are under construction to meet the requirements of the Soviet Food Program, and to improve the cost efficiency of the entire fisheries industry.
[609-12172]

TASTY INVENTION

Moscow SOVETSKAYA ROSSIYA in Russian 1 Apr 84 p 2

SUNGORKIN, V., correspondent, Vladivostok

[Abstract] Presentation is made of the work conducted under the direction of Al'bert P. Yarochkin, director of the New Proteins Laboratory of the Pacific Ocean Scientific Research Institute of Fisheries and Oceanography in Vladivostok. The particular topic under discussion deals with the production of sausage made out of pollock meat, which fully meets human nutrient requirements for all the essential amino acids, fats and carbohydrates and has no "fishy" odor or taste. Other aspects deal with the preparation of fish-protein concentrates which have found their way into such products as artificial milk, but the production of which has encountered administrative difficulties in the USSR. It appears that similar difficulties are encountered when attempts are made to introduce other inventions of similar nature, although abroad, such inventions are met with instant recognition and commercial success.
[593-12172]

GENETICS

BRIEFS

NEW SCIENTIFIC CENTER IN SIBERIA--Novosibirsk--A large genetic center will be set up in the Altai, Siberia. About 80 thousand hectares of land was put at the disposal of scientists. Academician Dmitry Belyaev, Director of the Institute of Cytology and Genetics of the Siberian Department of the USSR Academy of Sciences, told newsmen that the main task of the new center is to create a genetic stock of domesticated animals and birds that would be well-adjusted to Siberia's climate. Scientists intend, specifically, to try to domesticate wild animals for two purposes: first, to create favorable conditions for the breeding of extinct species, and, second, to evolve new promising strains for agriculture. Elk, wood grouse, hazel grouse, partridge are at the top of the list of the species suggested for domestication. In the same way, scientists hope to increase the number of fur animals, for instance otters, that were once wide-spread in the Altai and are extinct now. The genetic center in the Altai will become a base for scientific research not only in genetics and animal selection. New varieties of cereals and fodder crops will also be evolved at the center. [Text] [Moscow TASS in English 1 May 84]

CSO: 1840/617

HUMAN FACTORS

COMPUTER-MONITORED AUTOGENIC CONDITIONING SYSTEM

Moscow IZVESTIYA in Russian 2 May 84 p 6

[Article by S. Krayukhin]

[Text] An All-Union Symposium on Problems of Medical Cybernetics has been held in Losevo, near Leningrad. I interviewed V. M. Akhutin, director of the Scientific Center of Biological and Medical Cybernetics of the Leningrad Electrical Engineering Institute.

"Vladimir Mikhaylovich, at your institute a system of electronic instruments has been developed which helps... build character. Is that true?"

"To a certain degree it is. All of us know how important it is to develop courage, decisiveness and the ability to overcome anxiety and fear. Autogenic conditioning--the conscious self-development of the volitional aspects of character--can play a significant role here. It proved possible to develop and strengthen these qualities with the aid of modern computer technology."

"How does autogenic conditioning work according to your system?"

"I'll try to explain. In the man-machine interaction, there is a feedback system which enables the trainee to observe his own physiological reactions. One of them, for example, he can observe on a TV screen in the form of a variable curve. And not only observe, but also influence its nature by the exercise of will power. This reaction reflects the characteristics of the subject's emotional state. Having set himself the goal of correcting weaknesses of character, for example, to develop fearlessness and the ability to overcome excessive anxiety and fear, the trainee independently, as if outside himself, controls his psychological reactions. By monitoring the instrument readings and gradually conditioning the will, he guides these reactions, so to speak, into a normal channel."

"Are there any practical results as yet?"

"Results have been obtained, and they are encouraging. Our instrument system was tested at the neurosis clinic of the Institute of Physiology imeni Pavlov and at the Institute of Physical Culture. The evaluations of scientists and clinicians are positive. They all note that the cyber-trainer helped overcome excessive anxiety and fear."

"Divers, miners, pilots, mountain climbers--anyone whose work involves a high level of risk and emotional stresses--will be able to do self-conditioning with this system. The exercises with the electronic trainer last a month, and the beneficial psychological changes in the trainees are retained for a rather lengthy period."

PTD/SNAP
CSO: 1840/608

UDC 612.821.3:613.86

LINK BETWEEN INDEXES FOR MENTAL WORK CAPACITY AND PARAMETERS IN CIRCULATORY SYSTEM BEFORE AND AFTER PHYSICAL STRESS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 5 Oct 82) pp 897-901

SAPOVA, N. I. and PAVLOVA, T. A., Leningrad

[Abstract] A study was made of 16 male subjects aged 23-35 to investigate the dynamics of mental work capacity following low-level physical stress. Interval cardiograms and rheoencephalograms using left and right frontal mastoidal leads, and integrated total-body rheograms were made during the entire period of examinations (20-35 minutes). Respiratory volume was determined by spirometry and the arterial pressure and other circulatory parameters were measured. Subjects performed tests involving the operational memory at rest and following ergometer stress. Complex physiological and psychophysiological indexes were assessed using the methods of Student and Wilcoxon with the aid of regression analysis. The findings indicate small but definite changes in cerebral circulation and cardiac rhythm in mental work done without substantial nervous-emotional tension and moderate elevation of mental work capacity following relatively mild physical work. It is concluded that in some cases light physical work of short duration is capable of enhancing mental work capacity. Figures 2; references 14 (Russian)
[579-9642]

UDC 612.56.004.58

EFFECT OF BODY TEMPERATURE ON HUMAN WORK CAPACITY

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 4 Nov 82) pp 963-968

PAVLOV, A. S. Machine Building Institute, Voroshilovgrad

[Abstract] A study was made of changes in human work capacity as a function of elevated body temperature resulting from physical work. Hyperthermia was induced by step-test physical work in two groups of subjects (physically untrained 126, physically trained 47) aged 17-21. The index of work capacity was calculated as $(a \cdot 100) / (b \cdot 2)$, where a is the time spent working and b is the sum of 3 heart rate readings taken during 1-3 minutes immediately following cessation of work. Rectal temperature was used as the index for body

temperature. Studies were conducted at an ambient temperature of 22-24°C after baseline values had been established for each subject. Mean changes in work capacity indexes for various kinds of muscular activity and simple visual-motor responses were determined. In endogenous hyperthermia induced by muscular work, both physical and mental work capacity was improved initially 8-12%, but later fell to below initial values. Optimal body temperature promoting maximum physical and mental work capacity in physically trained subjects was $38.7-39.0 \pm 0.1^\circ\text{C}$. Optimal functioning of the body is not always insured when body temperature is maintained through homeostasis. Further studies are required to determine the physiological boundaries for maximum mobilization of work capacity in trained subjects. References 19: 13 Russian, 6 Western. [579-9642]

UDC 612.821

LINK BETWEEN CHARACTERISTICS OF EEG RHYTHMS IN BIOFEEDBACK CONTROL AND INDEXES FOR OPERATOR ACTIVITY

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 15 Oct 82) pp 994-998

MARKMAN, V. G., KURGUZOV, S. S. and KHANDOV, M. Z. Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences, Leningrad

[Abstract] A study was made of the feasibility of predicting operator abilities on the basis of individual characteristics in conscious control of EEG rhythms. After establishing baseline values for comparing biofeedback control of EEG parameters and the ability to track a radar target on a laboratory simulator, tests were conducted on 160 subjects. Subjects were divided into two groups; one was trained to increase the alpha-rhythm, the other to reduce theta-rhythm. Determinations were then made of the working characteristics of subjects as they solved problems on a radar tracking simulator. Results are shown for visual-motor compensation tracking, conscious control of alpha-rhythm and work on the radar simulator, and conscious control of alpha- and theta-rhythm and task-solving on the radar simulator. The findings show that biofeedback control of EEG parameters was not associated with time-based assessments of operator skill and that the indexes for biofeedback control of alpha-rhythm enable prediction of success in operator task-solving in extreme conditions. Figures 1; references 11: 10 Russian, 1 Western.
[579-9642]

UDC 612.84

QUANTITATIVE ASSESSMENT OF ROLE OF SPATIAL FREQUENCIES OF IMAGES IN VISUAL RECOGNITION OF NUMBERS

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 22 Nov 82) pp 999-1004

BORISOVA, Ye. D. AUCCTU [All-Union Scientific Research Institute of Labor Protection] Leningrad

[Abstract] A quantitative evaluation was made of the role of the spatial frequency component of the Fourier spectrum for symbols (figures) during the process of visual recognition. In contrast to other studies employing a grid-type stimulus, in this work actual images were used whose spectral composition was altered in accordance with the tasks set: after band-elimination spatial filtering in a digital computer, the spatial frequency above a predetermined level was clipped; the remaining part of the image was not distorted. Psycho-physiological characteristics in recognition of the filtered images were studied using a tachistoscopic method. The digits used in the study (0, 2, 3, 5, 6, 9) were generated on a field having the angular measurement of $0.625^{\circ} \cdot 1^{\circ}$. When spatial frequencies higher than 1.22 cycles per degree were filtered out, images were virtually unrecognizable. Within the range of spatial frequencies 1.66 to 2.76 cycles per degree, a high degree of recognition was achieved when exposure time was increased to 200-1,000 milliseconds. Filtering out frequencies higher than 2.76 cycles per degree did not affect the probability of recognition for any given digit. Image recognition patterns were retained when contrast was reduced within specific limits, but reduction of contrast caused lower correct recognition values when exposure time was reduced.

Figures 5: references 17: 9 Russian, 8 Western.

[579-9642]

UDC 612.812

LINK BETWEEN BLOOD CATECHOLAMINE LEVELS AND INDIVIDUAL FEATURES IN DYNAMICS OF OPERATOR ERROR

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 6 Dec 82) pp 1023-1024

POPOV, S. Ye. and MIROLYUBOV, A. V. Military Medical Academy imeni S.M. Kirov, Leningrad

[Abstract] It has been suggested elsewhere that at the biochemical level, activating mechanisms are supported by the adrenergic system, whose activeness can to a certain degree be used to determine the dynamics in operator work quality indexes. In order to check this suggestion a comparative study was made of the catecholamine level in the peripheral blood and the periodicity of operator error. The study was conducted in 12 healthy male volunteers aged 25-30. Findings indicated a regular association between the catecholamine

level, the frequency of operator error and the activity of the central nervous system. Subjects with higher catecholamine levels and displaying greater activeness were able to cope with a greater information load. The catecholamine level and activeness seemed to be associated only with the dynamic work indexes but not with the overall level of operator error. Figures 1; references 3 (Russian).
[579-9642]

SUCCESSFUL SCIENTIST

Moscow PRAVDA in Russian 28 Apr 84 p 3

VASIN, M.

[Abstract] A biographical sketch is provided of Valeriy Venda who, upon graduation from the Moscow Energy Institute, was charged with the creation of a model control panel for the Moscow Power Station No 21 as his first assignment at the Central Scientific Research Institute of Complex Automation. To accomplish this task he had to collect a group of specialists from different fields and, with their cooperation, formulate the principles which underlie man-machine interactions and assess human functional capacity when challenged with different volumes of information input. The problem was successfully concluded and since that time V. Venda has earned a doctorate in psychology and, as a professor, has founded engineering psychology laboratories at two institutes. There is considerable interest in his ideas on psychology and engineering in the USSR and abroad, and in Japan alone he has already lectured seventeen times.

[590-12172]

IMMUNOLOGY

INFLUENZA VACCINE PRODUCTION FACILITY DESCRIBED

Moscow IZVESTIYA in Russian 20 Apr 84 p 6

IVCHENKO, L.

[Abstract] The article describes a visit to the influenza vaccine production facility of the USSR Ministry of Health Leningrad Scientific Research Institute of Vaccines and Serums. It is said to be the world's largest mass producer of whole-virgin inactivated influenza vaccine, turning out 22 million doses annually. The author was familiarized with the production process by Rozaliya Nikolayevna Rodionova, director of the institute, and Lyubov' Aleksandrovna Zazimko, deputy director. Zazimko said the vaccine type currently in production is Di-vaccine, which contains antigens of both sub-types of A virus, which are circulating at the present time. It is mentioned that the facility is installing the world's first filtration-chromatography line. Scheduled to begin handling series production next year, it will produce vaccine pure enough for vaccination of children, which is said to be currently in short supply. The line will also make it possible to produce several varieties of vaccines, depending on needs. It is also noted that the institute is doing work on genetic engineering methods of obtaining vaccines in which hereditary material of the virus is built into the genetic apparatus of *B. coli*. Zazimko said that this technology will permit development of a polyvalent vaccine containing antigens of all types of viruses.

FTD/SNAP
CSO: 1840/602

EPIDEMIOLOGY INSTITUTE DEVELOPS DIAGNOSTIC AND INTERFERON PREPARATIONS

Moscow MEDITSINSKAYA GAZETA in Russian 28 Mar 84 p 4

LEPEKHIN, A.

[Abstract] The article reports on the development--at the Leningrad Scientific Research Institute of Epidemiology and Microbiology--of improved methods and preparations for the quick diagnosis, prevention and treatment of infectious diseases and inflammatory processes caused by microorganisms. The obtaining of

A-protein from a staphylococcal cell is called the most significant recent achievement of this institute's research of quick-diagnosis methods. The presence of tick-borne encephalitis, for example, can be determined in only three minutes with the aid of a preparation based on A-protein. Professor F. Noskov, deputy director of the institute in charge of scientific work, mentioned plans for producing the first experimental lot of A-protein preparations for immunoenzyme analysis in 1985.

Another area of the institute's work is the development of methods of synthesizing interferon. The most promising method is microbiological synthesis using *B. coli* and yeast cells as source material. Under the direction of A. Smorodintsev, highly-concentrated interferon suitable for medical purposes reportedly has been obtained by means of complex biochemical conversions using a set of mechanical and thermal manipulations. Due to the presence of microbe impurities, this interferon is still not suitable for injection preparations. Work on methods of purification remains to be done. The work is being carried out in the institute's laboratory of children's virus infections, with the collaboration of the Leningrad Pediatric Medical Institute. V. Iovlev and A. Stepanov are associates of the laboratory who are identified as participants in this work.

FTD/SNAP
CSO: 1840/605

LASER EFFECTS

LASERS TREAT HEART DISEASE

Moscow MEDITSINSKAYA GAZETA in Russian 1 May 84 p 3

BALAKHIN, G.

[Excerpt] The title treatment procedure was a simple one. An ordinary medical needle was introduced into a vein. Attached to the needle was an optical fiber. Arterial pressure, pulse and cardiac rhythm were recorded precisely by instruments placed around a patient with acute heart pain, who had been brought for treatment to the emergency ward.

Thirty minutes passed, and engineer-physicist S. V. Revyakin, an associate of the experimental laboratory of the Novosibirsk Scientific Research Institute of Circulation Pathology, switched off the current to an instrument, the "LG-75", which had been putting radiation into the vein.

After three or four such treatments, the patient feels considerably better. This has been confirmed also by attending physicians.

T. V. Zarezhko, a therapist of Infarct Department No. 1 of City Clinical First-Aid Hospital No. 1, related:

"Beginning in 1982, we have treated about 60 patients with ischemic heart disease using a laser. Among them were 27 persons with preinfarct conditions and 25 with myocardial infarctions; 13 patients were treated a second time. Definite clinical improvement has been noted in 40 patients. In what ways has it been manifested? The number of attacks of stenocardia in the course of a day has decreased, and in some patients they have disappeared completely. The nature of attacks of pain has changed."

In 1982, the presidium of the scientific Medical Council of the RSFSR Ministry of Health and the USSR State Committee for Science and Technology set the following task for the institute's staff: develop methods of direct laser irradiation of the exposed heart in cardiosurgical operations and terminal states, and develop indications and contraindications for the use of laser irradiation of the exposed heart in cardiosurgical interventions, and of intravenous laser irradiation.

Scientists of the institute had to demonstrate the safety of treatment using laser light and to ascertain optimal radiation power and density. G. B. Lenskiy,

V. A. Baykov and S. G. Sergeyeva, associates of the institute's experimental laboratory, and others, performed hundreds of experiments on animals under the direction of Ye. N. Meshalkin, member of the USSR Academy of Medical Sciences and director of the institute, and Professor V. S. Sergiyevskiy. More than 2,000 sessions of intravenous irradiation have now been performed at four different clinical facilities.

Not all physicians accept such treatment without reservations, however. They think the laser probably has a more psychotherapeutic effect on the patient. "We do not rule out the possibility of such an effect, although so-called 'false' treatments have been done, with the apparatus switched off, and they yielded no positive results," said science associates L. A. Devyat'yarov and A. A. Prikhodchenko. "In our opinion, laser therapy stimulates and improves the process of blood exchange, and the blood receives a certain 'energy' which it carries to all of the organs of a human being or animal. There are already a number of objective tests which demonstrate the method's effectiveness. This has been written about in special collections of the institute's published works."

Experiments have demonstrated that laser irradiation of the exposed heart has a positive effect in combating sudden cardiac arrest and experimental myocardial infarction. Infarct shock did not develop and ventricular fibrillation did not occur in the overwhelming majority of the animals. The experiments are continuing.

"Scientists of the Institute of Cytology and Genetics of the USSR Academy of Sciences' Siberian Department are cooperating closely with us," said Professor V. S. Sergiyevskiy. "What have the geneticists discovered? Laser radiation in small doses has no substantial effect on chromosomes."

Explaining the essence of the work that has been done, Ye. N. Meshalkin said: "On the basis of strictly objective data, we have demonstrated that certain doses of laser irradiation have a stimulating effect and are capable of preventing fatal complications in a number of cases. A considerable amount of experimental work still has to be done, however."

FTD/SNAP
CSO: 1840/607

UDC 577.391:547.963.3

INFLUENCE OF PULSED LASER RADIATION ON NUCLEIC ACID AND PROTEIN SYNTHESIS IN TUMOR CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 9 Jan 82) pp 668-670

MOSKALIK, K. G., KOZLOV, A. P. and POSPELOVA, I. I., Institute of Oncology imeni Professor N. N. Petrov, USSR Ministry of Health, Leningrad

[Abstract] Ehrlich ascites tumor cells were subjected to 10 laser bursts of energy density of 10 J/cm^2 or 100 J/cm^2 after which $5 \cdot 10^6$ intact or irradiated cells were transplanted intraperitoneally into female SHR mice (weight, 18-20g) to study the effect of pulsed laser radiation. Laser bursts of 10 J/cm^2 increased the number of DNA synthesizing cells and increased DNA synthesis in the cells while irradiation of energy density of 100 J/cm^2 decreased DNA synthesis intensity in the tumor cells. Laser irradiation also affects RNA synthesis with the effect depending on the energy density. Stimulation of nucleic acid and protein synthesis increases after low doses but decreases after high laser irradiation doses. It was assumed that cell growth inhibition by large doses of laser radiation is caused by direct cell destruction by the laser beam and by inhibition of synthetic processes in the cells.

References 13: 9 Russian, 4 Western.

[614-2791]

UDC 539.1.047

COMPARATIVE STUDY OF BIOLOGICAL ACTIVITY OF RED AND VIOLET LASER RADIATIONS

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 28 Jun 82) pp 706-709

KOZHIN, A. A., KHUSAINOVA, I. S. and ZHUKOV, V. V., Rostov State University imeni M. A. Suslov

[Abstract] Comparison of the biological effect of red and violet monochromatic laser radiation on the state of rat reproductive organs is discussed. A wide range of reactions was noted in response of the rat organism to both types of radiation. The number and diversity of the responses make it difficult to interpret or generalize concerning them. Possible mechanisms of the changes are discussed. The findings concerning the reaction of the sex system to the various radiations may be used in developing tactics for the use of lasers for biomedical purposes. References 7: 6 Russian, 1 Western.

[614-2791]

PROGRESS IN LASER SURGERY

Moscow PRAVDA in Russian 9 Apr 84 p 7

SKOBELKIN, O., Chief, All-Union Center for Laser Surgery, USSR State Prize laureate, doctor of medical sciences

[Abstract] Some advances and advantages of laser surgery are reviewed, particularly as the field has developed in the USSR. Various lasers are undergoing extensive clinical testing by urologists, oncologists, gynecologists, stomatologists and neurosurgeons to assess the utility of such instruments in patient management, and to define the limits of their applicability. Studies done largely with CO₂ lasers have shown that their surgical use involves relatively little pain, edema or inflammation, as well as only limited tissue deformation and hemorrhage. Current efforts are directed at expanding the type of surgical lasers available, and on the construction of endoscopic laser instruments utilizing the latest fiber optics technology.

[600-12172]

MEDICINE

CRYOGENIC PROBES FOR OPHTHALMOLOGY AND SURGERY

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 Feb 84 p 4

[Excerpt] Surgeons enlisted cold as an ally long ago. It blocks small blood vessels, making scalpel incisions practically bloodless. And it also has a healing effect in certain cases. But physicians use one type of instrument for the freezing of tissues, and perform operations with other ones. Thanks to work done at the Ukrainian Academy of Sciences' Physical-Technical Institute of Low Temperatures, specialists have now obtained instruments which combine the functions of freezing and medical instruments. For example, an extremely fine probe that can be cooled has been developed for ophthalmologists, for extracting cataracts and removing foreign bodies from eyes. And a cryogenic probe, the "KM-18", has been developed for surgeons. A great variety of operations, including brain operations, can be performed with this probe. As compared with a metal scalpel, this instrument also produces a good cosmetic effect; the incision is so thin and painless that it heals practically without a trace.

FTD/SNAP
CSO: 1840/605

KOKHINOR UNIT PRESERVES VITAL ORGAN FUNCTION

Moscow MEDITSINSKAYA GAZETA in Russian 29 Feb 84 p 4

LEPEKHIN, A.

[Text] Leningrad--Medical scientists of the USSR Ministry of Health's Scientific Research Institute of Transplantology and Artificial Organs and science associates of the Design and Experimental Bureau of Biological and Medical Cybernetics have developed the "Kokhinor" unit, which is capable of sustaining the vital function of the heart, liver, lungs and kidneys outside the body in special containers.

The preservation of organs and tissues is one of the most important tasks of transplantology. The method used most widely at present--freezing--is not totally reliable. Matters are even more complicated for organs such as the heart, the liver and the lungs. To preserve them outside the body, conditions maximally approaching natural conditions are necessary. For example, the heart can continue to live and function only when it is supplied with oxygen and other nutrients, and this is exactly how the container for the heart is set up.

"The unit also makes it possible to administer various medicinal preparations and to study comprehensively their effect," said Doctor of Technical Sciences, Prof. V. M. Akhutin, the bureau's chief designer. "Thus, the 'Kokhinor' unit can be of service not only to transplantologists, but also to representatives of other branches of medicine."

One "Kokhinor" unit has been built thus far. When optimum conditions for organ preservation have been worked out on it, it will become possible to produce it serially.

The new unit was demonstrated at the international exhibition "Nauka-83" [Science-83] in Moscow and at an exhibition organized by the Council for Mutual Economic Aid in Smolensk. It was awarded three international certificates.

FTD/SNAP
CSO: 1840/603

MEDICAL PRODUCTS OF SILOXANE RUBBER

Moscow VECHERNYAYA MOSKVA in Russian 24 Feb 84 p 1

[Text] Scientists have developed original polymer materials for medical use. They are intended for the manufacture of various kinds of medical products: heart-massage devices, probes and catheters, artificial blood vessels, drainage systems for the treatment of many diseases, and contact lenses.

The new siloxane rubbers, which were developed by specialists of the Institute of Fine Chemical Engineering and the special design bureau of the cable industry, can be used very successfully for making elastic implants which are used in ophthalmology for the treatment of a serious disorder--detached retina. With their help, complex eye surgery will be considerably facilitated.

The innovation differs from conventional materials by its heightened transparency and the possibility of controlling its rigidity. It is also very important that the proposed rubber compositions retain their properties for a long time. This is extremely important in the industrial manufacture of medical products.

Today, series production of the new rubbers began at the test plant of the special design bureau of the cable industry.

FTD/SNAP
CSO: 1840/603

BIOLOGICAL ADHESIVE FOR JOINING BLOOD VESSELS

Leningrad LENINGRADSKAYA PRAVDA in Russian 11 Jan 84 p 1

[Text] Riga, January 10 (TASS)--A biological adhesive developed by specialists of the Latvian Neurosurgery Center substantially speeds up the joining of tiny vessels.

This bonding substance, which is obtained from components of blood, firmly splices thin branches of arteries with diameters of up to 1.5 millimeters, without causing a rejection reaction. This adhesive is prepared from two different powders directly in the operating room. This takes a matter of minutes. When both parts are mixed together in a solution, a sticky, gelatinous mass is formed. Applied to the ends of vessels, it promotes their natural inosculation and is completely resolved within approximately a week.

This innovation makes it possible to reduce substantially the number of thread sutures that are made. It can also be used for stopping capillary hemorrhages.

FTD/SNAP
CSO: 1840/607

UDC 617-001.17-085.38.015.2:615.246.2

HEMOSORPTION IN BURN DISEASE

Moscow KHIRURGIYA in Russian No 4, Apr 84 (manuscript received 6 Jun 83)
pp 52-55

KOGAN, YA. A., IVANNIKOV, N. F., docent, and BELOV, N. N., Central Municipal Clinical Hospital, Kemerovo; Anesthesiology and Reanimation Course (director, docent N. F. Ivannikov), Kemerovo Medical Institute; Department of Topographic and Operative Surgery (director, Yu. M. Lopukhin, USSR Academy of Sciences) Second Moscow Medical Institute imeni N. I. Pirogov

[Abstract] Use of 141 detoxication sessions with various sorbents in combined therapy on 62 persons, ranging in age from 2 years up to 75 years and having severe burns, was described and discussed. Sorption methods of cleansing the blood of the victims removed toxic products from the organism, improved the clinical course of burn disease and reduced mortality by 10-15 percent. It was found that hemosorption sessions must be repeated every third or fourth day in order to combat constant entry of toxic metabolites into the blood. Effectiveness of the sorbents used and side effects produced by them are discussed. SKN [not further identified] sorbent was found to be most effective. Use of extracorporeal cleansing, utilizing the aviation service to remote areas was mentioned. Figure 1; references 5: 4 Russian, 1 Western. [1046-2791]

UDC 617-001.17-06.616.331.34-005.1

GASTROINTESTINAL HEMORRHAGES IN BURN VICTIMS

Moscow KHIRURGIYA in Russian No 4, Apr 84 (manuscript received 17 Feb 82)
pp 55-59

PARIS, Ye. I. and IVANOVA, R. M., docents, First Department of Surgery (director, professor V. P. Zinevich), Leningrad Institute of Advanced Training of Physicians; Burn Section (director, professor A. N. Orlov), Leningrad Municipal Hospital No 5

[Abstract] Gastrointestinal hemorrhage occurred in 109 out of 8021 cases of burn disease in persons ranging in age from two up to 81 years. Frequency of occurrence, nature and sources of gastrointestinal hemorrhages differed

according to the time lapse from the time the burn occurred and the period of burn disease. Most diffuse hemorrhages (38%) occurred in the first period of burn disease. The second period is dangerous because of the appearance of profuse hemorrhages in this period. The beginning of the third period of burn disease is singled out because the most profuse hemorrhages (15) occurred in this period. Causes of hemorrhage in this period included: Curling's ulcer in seven patients, erosive lesions of the intestinal wall (16 cases) and abdominal purpura (3 cases). No cause for hemorrhage was found in two cases. Unexplained hemorrhage is a typical feature of the period of shock. Their number decreased in the second period and practically none occurred in the third period of burn disease. Emergency surgery to arrest hemorrhage is indicated after 12 hours of failure while using conservative measures. Figure 1; references 13: 6 Russian, 7 Western.

[1046-2791]

UDC 617-001.17-06:616.3-005.1

HEMORRHAGE FROM DIGESTIVE TRACT OF BURN PATIENTS

Moscow KHIRURGIYA in Russian No 4, Apr 84 (manuscript received 26 Oct 81)
pp 59-61

SVESHNIKOV, A. I., candidate of medical sciences, Acute Burn Department (Director, candidate of medical sciences L. I. Gerasimova), Scientific Research Institute of First Aid imeni N. V. Sklifosovskiy, Moscow

[Abstract] Observations of 45 burn patients treated at the Scientific Research Institute of First Aid imeni N. V. Sklifosovskiy in the 1971-1981 period are described and discussed. Eight of 45 patients recovered. One-fourth of the patients died from continuing gastrointestinal hemorrhage. In 33 cases, hemorrhage was arrested but the patient died later from pneumonia, sepsis or other complications of burn disease. Hemorrhage from the digestive tract usually occurred after burns which covered more than 20 percent of the body. Hemorrhage of the digestive tract in persons with grave burns may begin in the first day after trauma but usually it occurs in periods of toxemia and septotoxemia concomitant with pneumonia or sepsis. Source of the hemorrhage was: acute ulcers and erosions of the stomach and duodenum (29 patients), acute ulcers and erosions of the esophagus and stomach (6 patients), chronic peptic and duodenal ulcers (5 patients) and rupture of the gastric mucosa (1 patient). The source of bleeding was not determined in one case. Emergency endoscopy of the stomach and duodenum was used to find the source of hemorrhage. Mortality from these conditions remains high in spite of conservative treatment and emergency surgery. References 16: 14 Russian, 2 Western.

[1046-2791]

UDC 617.576-001.22-084.844

PLASTIC SURGERY WITH A PEDICLE GRAFT IN RESTORATION OF BLOOD SUPPLY AND HAND FUNCTION AFTER ELECTRIC BURN

Moscow KHIRURGIYA in Russian No 4, Apr 84 (manuscript received 12 Jan 84)
pp 62-67

IVANOVA, N. P., doctor of medical sciences, BOLKHOVITINOVA, L. A., candidate of medical sciences, BELYAYEVA, A. A. and SEDOVA, S. V., Central Institute of Traumatology and Orthopedics (Director M. V. Volkov, Academician, USSR Academy of Medical Sciences

[Abstract] Treatment of 61 patients with severe deformities of the hand and forearm as sequelae of electric burn is described and discussed. Contrast angiography studies showed deep disturbance of blood circulation at the level of adducting and obducting vessels and at the level of the microcirculation in 12 patients. Circulatory disturbances played an important role in development of lack of function of the hand after electric burn. Treatment included excision of the scar tissue and application of skin grafts using large blood-supplied grafts to improve circulation for later reconstructive surgery. Treatment gave good cosmetic effects and partially restored or improved function of the hands. References 5 (Russian).

[1046-2791]

UDC 616.001.17-08

MODERN PRINCIPLES OF TRANSFUSION THERAPY IN ACUTE BURN DISEASE

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 21 Nov 83) pp 4-8

POVSTYANOY, N. Ye. and KOZINETS, G. P., Kiev Scientific Research Institute of Hematology and Blood Transfusion, Ukrainian SSR Ministry of Health

[Abstract] Study of the pathogenesis of burn shock and acute toxemia has revealed a number of mechanisms determining the course of acute burn disease. The major tasks of transfusion therapy during shock are replenishment of the volume of circulating plasma and assurance of adequate venous return to the heart. During acute burn toxemia, transfusion therapy is intended to maintain the volume of circulating protein, improve the rheologic properties of the blood, improve lymph formation and flow and support removal of toxic metabolites from the tissues. Based on observation of 144 patients in the stages of burn shock and acute burn toxemia ranging from 16 to 65 years of age, the authors have decided that hemotransfusion in acute shock is inferior to the use of colloidal plasma substitute solutions plus hemodilution. The systems of transfusion therapy suggested, in combination with hemosorption, allows the circulating blood volume to be maintained at the required level without substitute hemotransfusion, rapidly normalizing peripheral hemodynamics and microcirculation. References 29: 26 Russian, 3 Western.

[1045-6508]

PROGNOSIS OF BURN DISEASE BASED ON RULE OF 100

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 12 Dec 83) pp 9-12

POLISHCHUK, S. A. and YASNOCOR, L. A., Department of Elective Surgery No. 1,
Donets State Medical Institute imeni M. Gor'kiy

[Abstract] The rule of 100, a prognostic index determined by simply adding the percent body surface affected by the burn and the victim's age, is suggested for prognosis of the outcome of burn cases. In a retrospective study of 953 adult burn victims treated at the Donets Burn Center in 1971-1974, 4 levels of prognosis are suggested: favorable (index less than 60), relatively favorable (61-80), doubtful (81-100) and unfavorable (over 100). Additional factors which should be considered include injury to the respiratory tract, poisoning by combustion gases, combined trauma, time of beginning and adequacy of antishock therapy. References 10: 6 Russian, 4 Western.
[1045-6508]

INFLUENCE OF PARENTERAL NUTRITION AND ENTERAL TUBAL HYPERALIMENTATION ON CERTAIN HOMEOSTATIC INDICES IN BURN PATIENTS

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 21 Nov 83) pp 12-14

KLIMENKO, L. A., Department of Burn Treatment, Kiev Scientific Research Institute of Hematology and Blood Transfusion

[Abstract] A study was performed intended to develop the pathogenetic bases underlying methods of plastic and energy maintenance of the body of burn patients, as well as a comparative estimate of parenteral nutrition and enteral tube hyperalimentation. Results of studies of volemic indices in 45 patients with stage III and IV burns over 10 to 75% of the body surface are presented. Deep burns covered 6 to 47% of the body surface. Patient ages ranged from 17 to 62 years. Enteral tubal alimentation should not be considered an alternative to parenteral nutrition, since both methods of artificial nutrition are intended to supply the needs of the body for plastic and energy substances. Both methods have shortcomings: in parenteral nutrition, large volumes of energoplasic preparations must be administered, limiting the ability to perform other types of infusion therapy. Whereas effective plastic and energetic substances exist for parenteral nutrition, preparations for enteral tubal nutrition are only now under development and in testing. Enteral tubal nutrition with high calorie balanced natural products is reported to be more effective in terms of correcting certain homeostasis disorders in severe burn disease. References 9 (Russian).
[1045-6508]

UDC 616-001.17-089.844+616-001.186-089.844

SKIN-MUSCLE FLAP PLASTIC SURGERY AS CONSERVATIVE METHOD OF TREATMENT OF BURN AND FREEZE TRAUMA

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 4 Nov 83) pp 14-17

VIKHRIYEV, B. S., BELONOGOV, L. I. and KICHEMASOV, S. Kh., Department of Thermal Injuries, Military-Medical Academy imeni S. M. Kirov

[Abstract] Skin-muscle flap plastic surgery has been used at the authors' academy since 1980 in 27 cases involving patients 18 to 59 years of age with electrical and thermal burns as well as freezing trauma. Flaps from the broadest muscles of the back and legs have been used. The surgical procedure is described. In 22 of the 27 cases, results were satisfactory. The experience shows that free transplantation of skin-muscle flaps by microsurgical techniques is a new and promising method of treatment of thermal burns. It allows transplantation of large transplantates in a single stage, including skin and underlying tissue. The method is particularly promising for stage IV burns and frostbite in functionally active and anatomically important areas. References 8: 4 Russian, 4 Western.

[1045-6508]

UDC 616-001.17-089.844+611.778+615.832.9

USE OF CRYOPRESERVED SKIN IN BURN TREATMENT

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 21 Dec 83) pp 17-20

SANDOMIRSKIY, B. P., ISAYEV, Yu. I. and VOLKOVA, N. A., Institute of Problems of Cryobiology and Cryomedicine, Ukrainian SSR Academy of Sciences

[Abstract] The authors' institute has developed a method of cryopreservation of skin beneath a polyethylene oxide cryoprotector allowing preserved skin to retain high level of viability. Transplantation of cryopreserved skin at the Khar'kov Burn Center has been utilized on 14 patients with deep thermal burns over 5 to 40% of the body surface. Allotransplantates were selected by blood group, including Rh-factor. Continued histologic studies were used to evaluate the behavior of the preserved allotransplantates: temporary survival accompanied by desquamation of the epidermis and long-term preservation of the derma. A case history is briefly discussed. References 4: 3 Russian, 1 Western.

[1045-6508]

STUDY OF MAJOR COMPLICATIONS OF BURN DISEASE BY USE OF AUTOMATED COMBUSTIOLOGIC DATA BASE

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 23 Dec 83) pp 20-22

PETRUKHIN, V. A., TARASOV, A. A., PACHIN, S. F., MUBARAKOV, R. Kh., NENASHEVA, L. V., MIGAY, A. M., REVENKO, L. V. and SIZOV, V. M., Order of Lenin Institute of Sibernetics imeni G. M. Glushkov, Ukrainian SSR Academy of Sciences

[Abstract] The authors have developed a system for automating the collection and processing of medical information on the course of burn disease, using YeS series computers. The data base currently contains information on 485 victims treated at the Republic Burn Center, Ukrainian Ministry of Health, the Gor'kiy Burn Center and the Burn Department of Voroshilovgrad oblast clinical hospital. The information presented in this article indicates that in patients with critical and extensive burns the most frequent complications are in the respiratory system, homeostasis disorders, particularly during burn shock and toxemia, plus sepsis. Gastrointestinal complications were observed only in victims who died during the early stages of burn disease.

References 8: 5 Russian, 3 Western.

[1045-6508]

DYNAMICS OF PROTEOLYSIS AND PREKALLIKREIN-KALLIKREIN SYSTEM OF HUMAN BLOOD PLASMA IN BURN DISEASE

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 20 Sep 83) pp 22-25

VEREMEYENKO, K. N., VASIL'CHUK, Yu. M., KOZINETS, G. P., POGORELAYA, N. F. and POVSTYANOY, N. Ye., Kiev Scientific Research Institute of Hematology and Blood Transfusion; Republic Scientific-Methodologic Center for Medical Enzymology; Department of Traumatology and Military Field Surgery, Kiev Institute for Advanced Training of Physicians

[Abstract] The purpose of this article was to study the activity of proteolysis enzymes and their inhibitors as well as a number of components of the kynin system during the course of burn disease. Proteolytic activity was determined by a spectrophotometric method, the summary content of plasma blood inhibitors by the method of Kunitz, the level of α_2 -macroglobulin by the method of Veremeyenko. Observations involved 39 patients, 13 to 60 years in age, entering hospital 1 to 3 hours after injury. Proteolytic activity of the blood as well as serum proteinase inhibitor levels increased significantly in patients with stage III and IV burns. In these same patients, changes occurred

in the blood plasma indicating activation of the prekallikrein-kallikrein system. A sharp increase in antithryptic plasma activity is an unfavorable prognostic sign. References 14 (Russian).
[1045-6508]

UDC 616.9:616-001.17

PSEUDOMONAS INFECTION IN BURN CLINIC

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 4 Nov 83) pp 26-27

FEDOROVSKAYA, Ye. A., NAZARCHUK, L. V., LITOVCHENKO, P. P. and ZERKAL', O. D.,
Kiev Scientific Research Institute of Hematology and Blood Transfusion

[Abstract] A study was made of the sources of pseudomonas infection and paths of its propagation in a burn clinic, as well as the immune response of the patients to the presence of the pathogen. A study was based on analysis of purulent secretions, bioptates from wounds and the blood serum of 350 burn patients plus smears from various objects in the clinic, air samples, throat cultures and smears from the hands of medical personnel. It was found that pseudomonas infection may result from exogenous infection with *Ps. aeruginosa* by both contact and air paths of transmission. O-antibodies to the pathogen in 1:80-1:640 titer were found in the blood of patients beginning in the third week of the disease and extending to 6 months after recovery. The duration of circulation of specific humoral antibodies in the blood serum of convalescent patients following pseudomonas infection allows blood to be recommended as a source for the production of immune antipseudomonas preparations.

References 2: 1 Russian, 1 Western.

[1045-6508]

UDC 616-001.17-001.36

USE OF CERTAIN BIOLOGICAL TESTS TO ESTIMATE THE SEVERITY OF BURN SHOCK

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 8 Dec 82) pp 38-40

ZHELEZNYY, V. I., MICHURIN, V. F., POTAPSKIY, Yu. P. and USAKOVSKIY, R. I.,
Department of Surgery, Hospital No 2, Odessa Medical Institute imeni
N. I. Pirogov

[Abstract] The simplest and most accessible methods of study were used to estimate the severity of burn shock in 75 patients: determination of skin-rectal temperature gradient, hematocrit and central venous pressure. Medical indications of burn shock are described. A direct dependence was observed between hematocrit and skin-rectal temperature gradient and severity of burn shock, an inverse dependence between central venous pressure and severity of burn shock. The skin-rectal temperature gradient was found to be quite sensitive as an indicator in mild shock cases. References 3 (Russian).

[1045-6508]

UDC 616-001.17.4-08

TREATMENT OF BURN INJURY WITH MICROCIDE IN COMBINATION WITH HEPARIN

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 29 Nov 83) pp 40-41

TANASIYENKO, I. D., PUS'KOV, N. I. and KORVATSKIY, B. G., Chairs of Surgery of the Sanitary-Hygiene Faculty and of Military Field Surgery of the Kiev Medical Institute imeni Academician A. A. Bogomolets; Republic Burn Center

[Abstract] Studies were made of 28 strains of different species of micro-organisms isolated from purulent foci in burn patients: hemolytic streptococcus, staphylococcus aureus, diphtheroids, proteus, E. coli and pseudomonas, as well as 6 types of microbe associations consisting of two or three types. The results of these studies *in vitro* showed that microcide has a bactericidal effect on gram-positive microflora and intestinal bacillus, a bacteriostatic effect on proteus and pseudomonas both as monocultures and in associations. The combination of microcide plus heparin has almost twice the effectiveness of bactericidal action, in spite of the fact that heparin alone has no antibacterial effect. The combination has a bactericidal effect even on such antibiotic-resistant species of microflora as pseudomonas and proteus. The combination was then used in the treatment of 51 patients 15 to 55 years of age with burn trauma. Dressings were changed once per day, the wounds washed with a 3% solution of hydrogen peroxide, a furacillin solution or rivanol solution and the wounds were treated with microcide plus heparin. Complete sterilization of burn wounds was not achieved in any of the cases, though significant reductions in microflora and improvement of results were achieved. The combination is recommended for broader application in treatment of burn wounds. References 1 (Russian).

[1045-6508]

UDC 616-001.17-073.48

ULTRASONIC TREATMENT OF EXTENSIVE BURNS

Kiev KLINICHESKAYA KHIRURGIYA in Russian No 3, Mar 84
(manuscript received 10 Nov 83) pp 65-66

BIK, V. G., Department of Traumatology, Orthopedics and Military-Field Surgery, L'vov Medical Institute

[Abstract] A brief description of the URSK-7n ultrasonic oscillator is presented. It is reported that the device allows medication-ultrasonic treatment of infected wound surfaces in any location and of any size with minimum expenditure of medication, and does not cause overheating of medication solutions. Figures 3.

[1045-6508]

UDC 616.12-005.4-085.849.11-036.8.07:616.154.453-074

HYDROCORTISONE AND ALDOSTERONE LEVEL IN BLOOD OF ISCHEMIC HEART DISEASE PATIENTS DURING TREATMENT WITH A VARIABLE MAGNETIC FIELD

Moscow VOPROSY KURORTOLOGII FIZIOTERAPII I LECHEBNOY FIZICHESKOY KUL'TURY in Russian No 2, Mar-Apr 84 (manuscript received 14 Mar 83) pp 33-35

PONOMAREV, Yu. T., SOROKINA, Ye. I., BOBKOV, A. S. DAVYDOVA, O. B., KOROVKINA, Ye. G. and KACHKINBAYEV, K. A., Central Scientific Research Institute of Health Resort Science and Physiotherapy, Moscow

[Abstract] Study of the effect of variable magnetic fields on the hydrocortisone level and aldosterone level in blood of 33 persons with ischemic heart disease is described. One-time use of the variable magnetic field in the region of the upper thoracic paravertebral ganglia or in the precordial region did not affect the level of hormones being studied. A course of treatment with the magnetic field in the region of the paravertebral ganglia increased the hydrocortisone level. Aldosterone level was unchanged for the group as a whole but there was a considerable reduction of its level in about half of the patients. Application in the precordial region produced no significant changes in level of the hormones studied. References 7 (Russian).
[1044-2791]

UDC 616.98:579.841.93/-07:616.151.5-02:615.844.6

DYNAMICS OF CLINICAL SYMPTOMS AND RHEOGRAPHIC INDICATORS UNDER EFFECT OF HYDROCORTISONE AND LYDASE PHONOPHORESIS IN PATIENTS WITH BRUCELLOSIS SEQUELAE

Moscow VOPROSY KURORTOLOGII FIZIOTERAPII I LECHEBNOY FIZICHESKOY KUL'TUR in Russian No 2, Mar-Apr 84 (manuscript received 1 Nov 83) pp 40-42

SHAGULYAMOV, U. SH., Scientific Research Institute of Health Resort Science and Physiotherapy imeni N. A. Semashko, UzSSR Ministry of Health, Tashkent

[Abstract] Comparative study of effectiveness of hydrocortisone phonophoresis and lydase phonophoresis in treatment of persons with chronic brucellosis or sequelae of the disease is discussed. Patients (80) underwent combined treatment with hydrocortisone phonophoresis or combined treatment with lydase phonophoresis (74 persons). Most of the patients showed signs of worsening of blood circulation and disturbance of vascular tonus in the lower extremities. These signs were of a functional nature. Both procedures improved the course of chronic brucellosis but they should be prescribed for different situations. Hydrocortisone phonophoresis has a more pronounced normalizing effect on vascular tonus and is recommended for use in treating patients with pronounced angiodynastic phenomena and various degrees of collateral circulatory disturbances while lidase phonophoresis is more effective in treating pronounced changes of connective tissue structures and dystrophic degenerative changes of the backbone. References 4 (Russian).
[1044-2791]

BURN TREATMENT METHODS AND PREPARATIONS

Moscow MEDITSINSKAYA GAZETA in Russian 30 Apr 84 p 4

RUBTSOV, V.

[Abstract] This article reports on activities and developments of the burn center of the Latvian Scientific Research Institute of Traumatology and Orthopedics in Riga. Ol'ga Vasil'yevna Frolova is the director of the center. It is recalled that she came to the traumatology institute after the war and defended a candidate dissertation on the topic "Radiation Sickness and Burns". Frolova characterized her field as one combining several disciplines: general surgery, traumatology, and therapy. Among the center's leading personnel are Candidate of Medical Sciences L. K. Katlap, a specialist in restorative surgery following burns and injuries of the hand, and L. A. Ozolin'sh, a developer of medical aerosols. It is mentioned that the center has been working intensively on methods for employing skin substitutes in cases of burns covering large areas of the body. The center is credited with the development of numerous preparations. A combined preparation called "olazol'" which was developed recently, is said to have high anesthetic and antibacterial properties which stimulate the regeneration of tissues. It is highly effective for the treatment of skin burns, purulent-septic skin diseases and burns of the mucous membranes of the eyes, for cleaning wounds and for preparing skin for grafting. Sea-buckthorn oil, kladon-12, anestezin and chloramphenicol are among the active substances of olazol'. It is being produced by the Altay Vitamin Production and Agrarian Association. Personnel of the center reportedly are developing a new series of nitrofuran preparations in collaboration with the Latvian Institute of Organic Synthesis, which has good production facilities.

FTD/SNAP

CSO: 1840/608

OZONE TREATMENT OF TRANSFUSION BLOOD

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 22 Mar 84 p 4

[Abstract] The article reports on studies by the central scientific research laboratory of the Rostov Medical Institute aimed at determining whether ozone treatment can improve the healing properties of transfusion blood. This idea was proposed by Doctor of Medical Sciences, Prof. V. Shepatinovskiy. The studies reportedly have shown that after blood is treated with small concentrations of ozone, its red corpuscles supply oxygen to tissues better, which is important in transfusions to patients suffering severe trauma and shock. Ozone-treated blood is said to retain its activity longer, and less of it is required for transfusions. Small concentrations of ozone reportedly cause no harmful changes in the blood, the studies have shown. The medical researchers also are studying the therapeutic effects of direct inhalation of ozone in animals, and are developing apparatus for this. Igor' Bazlov, a sixth-year student in the institute's school of therapy, is involved in this research.

FTD/SNAP

CSO: 1840/606

MICROBIOLOGY

UDC 57.083.18

BLASTOBACTER AMINOOXIDANS: NEW BACTERIAL SPECIES GROWING AUTOTROPHICALLY
ON METHYLATED AMINES

Moscow MIKROBIOLOGIYA in Russian Vol 52, No 5, Sep-Oct 83
(manuscript received 10 May 82) pp 709-715

DORONINA, N. V., GOVORUKHINA, N. I. and TROTSENKO, Yu. A., Institute of
Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences

[Abstract] A novel bacterial species was isolated from active sludge which is capable of growth under $H_2 + O_2 + CO_2$ or on methylated amines, and was designated as *Blastobacter aminooxidans*. *B. aminooxidans* are Gram negative pleomorphic rods capable of budding, nonmotile, forming 2 mm yellow, round, slimy, convex colonies, capable of growth at 10-34°C and pH 6.5-8.0 with a generation time of 5-6 h. Optimum growth occurs at pH 7.2-7.8 and 29-32°C. The GC content of DNA is 69 ± 0.9 , the bacteria have a complete Krebs cycle and glyoxylate shunt, and assimilate MH_4 via the glutamate cycle and by reductive amination of alpha-keto-glutarate, pyruvate and glyoxylate. Figures 2; references 17: 7 Russian, 10 Western.

[580-12172]

UDC 582.282.017.73:577.152.34

ISOLATION AND BIOLOGICAL CHARACTERIZATION OF FACTOR STIMULATING PROTEASE
BIOSYNTHESIS IN MIXED FUNGAL CULTURES

Moscow MIKROBIOLOGIYA in Russian Vol 52, No 5, Sep-Oct 83
(manuscript received 23 Mar 82) pp 750-754

BUYAK, L. I., LANDAU, N. S., KOLESNIKOV, M. P. and VEGOROV, N. S., Moscow
State University imeni M. V. Lomonosov

[Abstract] *Aspergillus wentii* grown in pure culture and in mixed culture with *Asp. kanagawaensis* was shown to produce a factor stimulating exoprotease biosynthesis by the latter. The factor was identified as a hydroxyanthro-quinone pigment that, when added to the *Asp. kanagawaensis* culture in a concentration equal to its concentration in 20 ml of the starting *Asp. wentii* culture fluid, showed maximum stimulation of fibrinolytic and caseinolytic

activity to a level 3.7-fold greater than of the control *Asp. kanagawaensis* culture. Addition of greater concentrations of the factor diminished *Asp. kanagawaensis* biomass accumulation, and markedly depressed caseinolytic activity and completely abolished fibrinolytic activity. Addition of other anthroquinone pigments (alizarin, rubomycin, cinerubin; 0.1-100 μ g/ml) stimulated protease biosynthesis two- to 2.5-fold by *Asp. kanagawaensis*. Figures 2; references 18: 13 Russian, 5 Western.
[580-12172]

CALDEROBACTERIUM HYDROGENOPHILUM: NEW GENUS AND SPECIES OF EXTREMELY THERMOPHILIC HYDROGEN BACTERIUM AND ITS HYDROGENASE ACTIVITY

Moscow MIKROBIOLOGIYA in Russian Vol 52, No 5, Sep-Oct 83
(manuscript received 24 Aug 82) pp 781-788

KRYUKOV, V. R., SAVEL'YEVA, N. D. and PUSHEVA, M. A., Institute of Microbiology, USSR Academy of Sciences

[Abstract] Description is provided of a new extremely thermophilic hydrogen bacterium designated as *Calderobacterium hydrogenophilum*, isolated from the hydrotherms of the Uzon volcano in Kamchatka. The five isolated strains are obligate chemautotrophs that oxidize hydrogen aerobically, and fail to utilize any of 50 organic test compounds. The cells are Gram negative rods (0.35-0.5 x 2.0-8 μ m) with a growth temperature range of 50-82°, but with maximum growth at 74-76°C and a pH optimum of 6.0-7.0. DNA analysis showed GC content of 41 mol%, and both soluble and membrane-bound NAD-independent dehydrogenase activity. A type specimen is preserved in the hydrogen bacteria collection of the Institute of Microbiology, USSR Academy of Sciences. Figures 1; references 15: 5 Russian, 10 Western.
[580-12172]

UDC 579.822.92-222:550.72(477)

BACTERIAL DECOMPOSITION OF OXIDIZED MANGANESE ORES FROM NIKOPOL DEPOSITS

Moscow MIKROBIOLOGIYA in Russian Vol 52, No 5, Sep-Oct 83
(manuscript received 20 Jul 82) pp 851-856

BABENKO, Yu. S., DOLGIKH, L. M. and SEREBRYANAYA, M. Z., Dnepropetrovsk University

[Abstract] Microbial decomposition of manganese ores obtained from the Nikopol deposits was investigated with *Achromobacter delicatulus* 182, in order to increase the recovery of manganese and other elements. *A. delicatulus* was found effective in the transformation of psilomelane, psilomelane/pyrolusite and psilomelane/manganite ores in favoring selective removal of manganese. However, manganite was refractory to *A. delicatulus* treatment. In general, bacterial treatment of the ores results in the solubilization of 91.9-94.1% of the manganese, 73.6-76.6% of the phosphorus, 62.5-77.3% of the calcium, 40.4-55.6% of the silicon, and 47.7-57.6% of the aluminum. Figures 4; references 10: 6 Russian, 4 Western.
[580-12172]

NONIONIZING ELECTROMAGNETIC RADIATION EFFECTS

UDC 612.014.427:578.087.1

CHANGES IN ARTERIAL PRESSURE IN STATIC WORK AS FUNCTION OF TIME OF DAY AND DEGREE OF DISTURBANCE IN EARTH'S MAGNETIC FIELD

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 31 Aug 81) pp 892-896

KUZ'MENKO, V. A. and BULUYEV, A. B., Scientific Research Institute of Normal
Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences, Moscow

[Abstract] An attempt was made to compare changes in the arterial pressure in healthy subjects under various static muscular loads at different times of the day and different values for the geomagnetic field. Measurements were made over 62 days in 28 individuals aged 18-30 years, six times daily (1200, 1600, 2000, 2300, 0400 and 0800 hours) to determine systolic pressure and heart rate. Geomagnetic disturbance during measurements was assessed from data on the K-index, published elsewhere. Circadian patterns in systolic pressure under static muscular load were established. A correlation was found between disturbances in the geomagnetic field and pressor response during segments of the circadian cycle when arterial pressure was normally lower. Changes in arterial pressure did not appear to be associated directly with physical load as correlated with geomagnetic disturbance, nor in most cases, judging from heart rate, with any cardiac response. The range of possible changes in the arterial pressor response as a function of geomagnetic disturbance is commensurable with circadian changes in the excitation of circulatory regulation. Figures 2; references 13: 12 Russian, 1 Western.
[579-9642]

UDC 577.391

EFFECT OF SUPERHIGH-FREQUENCY ELECTROMAGNETIC WAVES ON POSTSYNAPTIC MEMBRANE MODEL

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 4 Feb 82) pp 670-672

AKOYEV, I. G., KOLOMYTKIN, O. V. and KUZNETSOV, V. I., Institute of
Biophysics, USSR Academy of Sciences, Pushchino

[Abstract] Study of the effect of electromagnetic radiation (EMI) (400 MHz) on electroconductivity of the conducting state of a model membrane showed that,

after the start of effect of EMI, electroconductivity of the open state of the ionic channel rose quickly and remained high throughout the effect of EMI but returned to the initial state after cessation of effect of EMI. Discussion of the possibility of a thermal mechanism of the effect of EMI on the ionic channel was presented. The findings concerning this explanation were inconclusive. Figures 2; references 6 (Russian).

[614-2791]

PHARMACOLOGY AND TOXICOLOGY

MAGNETIC METHODS FOR LOCALIZING MEDICINES

Ashkhabad TURKMENSKAYA ISKRA in Russian 13 Mar 84 p 3

[Text] Medicines which 'dose themselves out' in the body will become a hallmark of 21st-century pharmacology, according to scientists' predictions. Reaching the focus of a disease, these medicines' action will be prolonged and steady. Forecasts in this field are already supported by scientific research.

Magnetic microcapsules filled with a medicinal substance are being developed by associates of the Latvian Academy of Sciences' Institute of Physics in collaboration with medical scientists and biochemists of Moscow. These developments are considered a prototype of future medications. Each such capsule is visible only under a microscope--it is smaller than a micron in size.

"Since medicinal preparations decompose rather quickly in the body, they sometimes have to be introduced in large single doses or in small but frequent ones," said Professor E. Blums, head of a laboratory of the physics institute. "The microcapsules that are under development presumably will make this unnecessary. They are tiny polymer shells which are capable of holding and gradually releasing a medicinal substance, and at a certain point in the body, besides. They can be 'guided to their target' with the aid of a magnetic field.

"The possibility of magnetic localization of medicines has been demonstrated at our institute. Incidentally, even isolated blood cells can be used for the 'packaging' of medications. We have already succeeded in intensifying the magnetic properties of cells many times, as a result of which the cells become controllable."

FTD/SNAP
CSO: 1840/606

BRIEFS

DRUGS IN MAGNETIC MICROCAPSULES--According to scientists' predictions, drugs that "administer themselves" in the body will become a sign of 21st century pharmacology. Aiming directly at the heart of a disease, they will act more tractedly and uniformly. The prognosis in this field is already backed up by theoretical and experimental research. Workers at the Latvian SSR Academy of Sciences Institute of Physics, along with Moscow doctors and biochemists, are now developing magnetic microcapsules with medication inside. They are considered models of future drugs. Each of these capsules can be seen only under a microscope; it is smaller than one micron. "Since medical preparations deteriorate rather quickly in the body, it is necessary at times to introduce them either in large doses or too often," says the director of one of the institute's laboratories, Professor E. Y. Blums. "It is supposed that the microcapsules being developed will free us from a similar necessity. These are tiny polymer shells capable of holding a medicinal substance and releasing it gradually--at a specific point in the body besides. They can be directed to the goal by means of a magnetic field. It has been proven in our institute that the idea of magnetic localization of medication is practicable. Incidentally, for the "packing" of drugs we are trying to use even isolated blood cells." [Text] [Riga SOVETSKAYA LATVIYA in Russian 29 Mar 84 p 2] 12461

PHYSIOLOGY

SAFETY SUIT PROTECTS AT MINUS 130 DEGREES

Tbilisi ZARYA VOSTOKA in Russian 23 Mar 84 p 3

[Text] A suit for protection against extreme cold has been successfully tested at the USSR Ministry of Health's biophysics institute in Moscow. The suit was developed in the laboratory of individual means of protection of the All-Union Scientific Research Institute of Work Safety in Tbilisi.

It is intended for conducting emergency and repair work in an environment of high oxygen and nitrogen concentration at temperatures as low as minus 130 degrees.

The suit is equipped with a special microfan assembly and air regenerator. It is comfortable to wear and is reliable in service.

FTD/SNAP
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UDC 612.04.43:616.003.96

DYNAMICS OF FUNCTIONAL STATUS AND SUBJECTIVE SENSATIONS IN PROCESS OF HEAT ADAPTATION

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 19 Nov 82) pp 956-962

MAR'YANOVICH, A. T., BAKHAREV, V. D., GRIDIN, L. A. and YARTSEV, P. M.,
Military Medical Academy imeni S. M. Kirov, Leningrad

[Abstract] An attempt was made to compare and correlate objective functional status and subjective sensations in heat acclimation using 8 healthy young males as subjects who spent 2 hours daily for a total of 5 consecutive days in a climate chamber at a temperature of 49°C with relative humidity of 20%. The following parameters were measured in subjects: rectal temperature (every 5 minutes), heart rate (every 10 minutes), oxygen demand (VO_2) and carbon dioxide exhalation (VCO_2) at rest and during physical exercise. Intensity of perspiration was assessed by weighing subjects before and after exposure in the climate chamber. Subjective sensations (cheerfulness, interest in work, attention, mood, general feelings, calmness and poise, self-confidence, sensation of heat, discomfort, sweating) were reported according to a 7-point scale (plus 3 to minus 3). Objective and subjective findings were correlated using the Student methods for paired and unpaired samples. The results indicate that during the initial period of heat acclimation, improvement in the thermal status can be achieved through stressing the homeostatic mechanisms, without involving the cardiovascular system but involving increase in the most important nonspecific subjective index, namely, the sensation of discomfort. Two individual tactical approaches are possible during the period of heat acclimation in humans: either stressing of the homeostatic mechanisms to reduce impairment of the thermal balance to a minimum, or reducing stress and improving subjective sensations at the cost of elevated body temperature. Improving the body's thermal status can outrun subjective sensations of discomfort associated with altered environmental conditions. The subsequent status in which both impairment of the thermal balance and the degree of discomfort experienced subjectively are reduced to a certain minimum level should evidently be regarded as a sign of complete adaptation to the environment and the activities being conducted in it. Figures 2; references 16:
7 Russian, 9 Western.

[579-9642]

UDC 577.37 + 612.81

STUDY OF SPATIAL ASYMMETRY IN HUMAN EXTERNAL ELECTRICAL FIELD

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 18 Jun 82) pp 969-973

TORNUYEV, Yu. V. and KUDEL'KIN, S. A., Institute of Physiology, Siberian Department, USSR Academy of Medical Sciences, Novosibirsk

[Abstract] In the light of earlier work indicating an interconnection between certain regulatory mechanisms in the body and the body's electrical conductivity suggesting that changes in electrophysical parameters lie at the basis of mechanisms involved in shaping the superficial structure of the human body's electrical field, a study was made of the physiological information that can be derived from the body's electrical field and the dynamics of asymmetry in the body's electrical parameters when influenced by external factors. Electrical parameters were measured using methods devised earlier by the authors. The modulus of impedance and its active and response components were measured for symmetrical segments, and the coefficient of asymmetry calculated. A series of 102 experiments was conducted in a control group of 18 healthy volunteer subjects and 20 individuals receiving treatment for stage II hypertension. It was found that the nature of changes in the modulus of impedance and the electrical field virtually coincided in normal subjects and almost matched for the two opposite sides of the body. More marked asymmetry was found in individual segments, namely the jugular fossa and the areas of the heart, xiphoid process and umbilicus. Mean asymmetrical spread for impedance and superficial electrical field found in hypertensive subjects was at least twice as great as in healthy subjects. Temperature, static and dynamic loads, different breathing modes and partial restriction of circulation all caused changes in the coefficients of asymmetry for impedance and the external electrical field. The bodily response to external effects developed during the first 5 minutes of the effect and either returned to normal after at least 20 minutes or was reestablished at the new level. Figures 4; references 12 (Russian)

[579-9642]

UDC 612.821

PSYCHOPHYSICS OF PROPRIOCEPTIVE SENSIBILITY

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 83
(manuscript received 14 Sep 82) pp 974-978

RYBIN, I. A., SERGEYeva, A. N. and KASATOV, A. P., Ural State University imeni A. M. Gorkiy, Sverdlovsk

[Abstract] Results are presented from a study of subjective assessment of spatial shifts based on the sensory system of the musculoskeletal system. The ability of subjects to assess the angle of rotation of the forearm in the horizontal plane without visual control was investigated. Psychophysical functions were determined using Stevens' scales of apparent force (Stevens

and Mack, J. Exptl Psycho. 1959, vol 58). The 150 subjects employed in the experiment were of both sexes, aged 16-25, mainly students. Results were processed using the method of least squares. Results are presented in graphic and tabular form showing the distribution of subjects for the Stevens' function in active and passive movement compared with normal distribution, and the distribution of individual indexes for subjects in subgroups. Differences in active and passive movements are discussed and it is concluded that care should be taken with regard to the effectiveness of simulation training for sportsmen since development of motor skills is less adequate than in active training where learning to eliminate error promotes acquisition of a high level of "resistance to noise" in sensory signals. Figures 2; references 6: 2 Russian, 4 western.
(579-2642)

MEC 612.531

METHOD FOR ANALYZING INTERCONNECTION BETWEEN VALUES WHICH CHARACTERIZE CEREBRAL BIOELECTRICAL ACTIVITY

Moscow FIZIOLOGIYA CHELOVEKA in Russian Vol 9, No 6, Nov-Dec 81
Manuscript received 1 Dec 82 pp 1027-1030

UL'YANOV, N. I., Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] A method is proposed for analyzing the features of the electrical process in the link between sequential values recorded for bioelectrical activity in the human brain. The method is formalized always as a series of selected characteristics and can thus be applied for all kinds of methods used to record cerebral activity by employing implantable electrodes. In the model proposed, the values for a series $\{Y_i\}$ are considered as the sum of a certain predetermined sequence $\{f_i\}$ which is then defined as a trend and of a random sequence $\{X_i\}$ subject to a certain law of probability. The full mathematical apparatus of the method is shown and used to illustrate a problem involving an autoregressive series. It is shown that the method can be used to study the dynamics of functional links in various systems both at rest and under directed stimuli. Formulas are shown in an appendix for calculating parameters for the distribution function in evaluations of autoregressive coefficients. References 5 (Russian).
(579-2642)

PUBLIC HEALTH

WOMEN'S, CHILDREN'S MEDICAL SERVICES

Minak SOVETSKAYA BELORUSSIYA in Russian 30 Mar 84 p 3

[Text] Under the chairmanship of deputy N. A. Girseneok, a meeting of the BSSR Supreme Soviet commission on questions of women's labor and life, and the protection of motherhood and childhood has taken place, at which an examination was made of the problem of meeting the requirements of the law on protecting motherhood and childhood in the Tolochinskiy rayon. The commission noted that the Soviet of People's Deputies of the rayon, their executive committees, institutions of health and people's education, economic directors, and union committees have increased the attention given to questions of sanitation and easing working conditions for women, broadening the sphere of domestic services, improving specialized medical care for mothers and children, and guaranteeing the protection of their rights. It was also noted at the meeting that there is, in the rayon, an area of substantial deficiency in the organization of preventive examinations for women and children and preventive dispensary examinations for infants. Further improvement in the delivery of dental care is required. In a number of kolkhozes the proper attention is not paid to developing a network of institutions for pre-school children. In the decision they adopted, the commission recommended that the Ispolkom of the Tolochinskiy Rayon Soviet of People's Deputies eliminate the existing deficiencies and ensure the complete fulfillment of the health care guarantees for mother and child that are established by law and the allotment of aids and subsidies. Similar recommendations have been given to the Ispolkom of the Vitebsk Oblast Soviet of People's Deputies and to the BSSR Ministry of Health. The commission also examined questions of the progress in fulfilling previously made decisions and on the construction of a republic health care center for mother and child. V. E. Lobanok, deputy chairman of the Presidium of the BSSR Supreme Soviet took part in the work of the commission.

12461
CEO: 1640/596

Possible Pay Clinic in Tallinn

Tallinn SOVETSKAYA ESTONIYA in Russian 6 May 84 p 2

[Article by Eval'd Aleksandrovich Vyaert, Estonian SSR deputy minister of health, in the column "Soviet Estonia Information Bureau": "Possible Variants"]

[Text] Will there be a pay polyclinic in Tallinn? (A question posed at a unified political day and among the letters addressed to the editor by V. Nesterov, K. Link, and K. Egorov).

The deputy minister of health of the republic, E. A. Vyaert confirmed that the same question had been addressed to him personally at unified political days. A simple answer is impossible. And for this reason Eval'd Aleksandrovich is sharing his thoughts with the readers of our paper.

Dear readers! Let's think together over the subject of establishing a pay polyclinic in Tallinn. I doubt whether you know that, according to the most modest calculations, the construction costs for one polyclinic, intended for 600 visitors per day, run on the average from 1,200,000 to 1,400,000 rubles. but the problem is not even in procuring this money. We will pose the question differently: does it make sense to do this now, today. And another question: a pay polyclinic is a self-supporting institution. That is, it should cover all its expenditures for personnel salaries, equipment and technological operations.

In this let's assume that the time of the "lone" general practitioner is past. Today the diagnosis and treatment of disease is the result of group activity. The contact between physician and patient is only the tip of the iceberg. In order to diagnose a disease, the physician needs x-rays, a laboratory, a functional diagnostics office, etc., etc. And in a self-supporting polyclinic the patient has to pay all these expenses. And Tallinn is not such a big city. If, let's suppose, in Moscow, Leningrad, Kiev, and other major cities in the country, all these expenses were distributed among a huge contingent of patients, then we can estimate, if only approximately, how much pay-medical-services will actually cost you under the conditions in our comparatively small city.

Let's examine the problem of establishing a pay polyclinic in another aspect. What, in general, makes the people want to have such a polyclinic? In the first place, the fact that the rayon polyclinics are overloaded, and the

uchastok physician can allot an average of only 10-12 minutes to a patient. Naturally the patient wants a physician to listen attentively to all his complaints without hurrying, trying to understand their interrelationships so that he can, just as carefully, at length, and again without hurrying, give the patient all his recommendations. And for this about half an hour is necessary.

At the present stage, increasing uchastok therapeutic services at ministry of health rayon polyclinics seems to us the most realistic and expedient alternative. Our primary problem (and the most energetic measures are now being taken toward its solution) is lightening the uchastok physician's load and virtually giving him the opportunity to become what is called a "family" physician, who knows each of his patients thoroughly, his troubles and complexities, and who can give him the proper attention without leaving himself short of time.

Believe me, these are not merely good intentions. In the last six years the number of uchastoks in rayon polyclinics has already nearly doubled. But practice shows that even this is insufficient. There should be more uchastok physicians, many more. It is not difficult to guess that this also requires considerable resources.

According to our plan, by 1995 each medical uchastok will service no more than 1700 patients (meaning the adult population). And these are realistic plans.

It is no less important that every uchastok physician has a high level of professionalism, but also that he conform in terms of human qualities to the high status of a medical man faithful to the Hippocratic oath. He is obliged to be a psychologist, able to discern the mood and character of his patient.

I am fully aware that there will be more than a few people who, having read these lines, will shrug their shoulders and cite more than one or two facts irrefutably proving that for the present not all physicians who see patients in polyclinics measure up to these standards. But I likewise ask you to believe that we know this, and are taking all measures to make the selection of uchastok physicians stricter. And these measures are not founded only on good intentions.

A big job has been begun this year in terms of increasing specialized types of care; the number of otolaryngologists, neuropathologists, eye doctors, stomatologists, etc. is increasing.

Now think: can the establishment of a pay polyclinic be considered a priority task today? Of course we are by no means giving up these plans, just putting off their practical resolution for the time being. We will think and search. Maybe we will set out to establish self-supporting departments attached to rayon polyclinics. In this case the financing bases (medical equipment, technical operations) will be partially drawn from the state budget. Other variants are also possible. In a word, for the time being, we will wait with pay-medical-care while we try to perfect free medical care. As they say, there is a time for everything.

12461
CSO: 1840/588

INCREASING PRODUCTION OF MEDICAL EQUIPMENT

Leningrad LENINGRADSKAYA PRAVDA in Russian 20 Apr 84 p 1

[Text] (LenTASS)--The Communist Party and the Soviet government show constant care for the health of the Soviet people. Increasing the output of modern medical equipment is important for raising the level and the quality of health care services for the population.

In fulfilling the decisions of the 26th CPSU Congress and the subsequent plenums of the party central committee, and the instructions of comrade K. V. Chernenko, general secretary of the CPSU Central Committee and president of the presidium of the USSR Supreme Soviet, the Leningrad party organization is paying more attention to the solution of this problem.

Instruments and apparatus for the early diagnosis of various diseases, radiology, surgery, and biology are being developed and produced in industry. In the Leningrad Krasnogvardeyets union, the leading enterprise in the country's medical industry, production has begun of a unique apparatus, an "artificial heart-kidney", electrocardiographs, flexible endoscopes, and other equipment corresponding to the level of domestic and foreign standards.

In the course of the 11th 5-year plan the medical polymers factory has significantly increased its production output. The all-union scientific-research and designers institute for medical and laboratory equipment is conducting a wide range of scientific work. Dozens of enterprises and organizations are taking an active part in solving the most important public health problems, including the Svetlana unions, the Optical-Mechanical Enterprise imeni V. I. Lenin, Vibrator, Burevestnik, the Leningrad Electrotechnical Institute imeni V. I. Ul'yanov (Lenin), the state optical institute, the scientific research institute for high frequency currents, and the Izmeritel' and Gosmetr factories.

Yesterday in the Krasnogvardeyets union, the problems of increasing production of medical equipment were examined. The necessity of using the scientific and industrial potential of Leningrad enterprises and institutes more completely was emphasized, as was the importance of speeding up scientific and technical progress in industry, especially in the area of developing flexible automatic production facilities.

Additional measures were outlined for increasing production and raising the quality and reliability of medical industry production. It was noted that the primary task of Leningrad USSR Ministry of Health enterprises is working out and assimilating an experimental serial production of the scientifically and technically newest equipment, of a system of automated examinations of the population that guarantees accelerated and wide introduction in the practice of health care of progressive forms and methods of treating and preventing diseases.

The attention of the Lensoviet ispolkom chief health directorate, the Lenotlsaviet ispolkom health department, and medical institutions was paid to the importance of an active use of the equipment produced at Leningrad enterprises for dispensary examination of the population particularly.

It was emphasized that increasing the preparation of the cadres of qualified specialists for the satisfaction of the requirements of medicine and the medical industry is very important.

L. N. Zaykov, the first secretary of the CPSU Leningrad obkom, A.N. Gerasimov, secretary of the CPSU obkom, and the directors of a number of enterprises and organizations took part in examining these problems. The participants in the meeting viewed samples of modern medical equipment and familiarized themselves with the solution of the problems by its development and production in the Krasnogvardeyets union.

12461
CSO: 1840/566

PRESSURE CHAMBER COMPLEX AT SURGERY RESEARCH CENTER

Moscow MEDITSINSKAYA GAZETA in Russian 13 Apr 84 p 3

[Text] The hyperbaric oxygenation center of the USSR Academy of Medical Sciences' All-Union Surgery Research Center is the largest of its kind in Europe. Six huge steel cylindrical pressure chambers here are equipped with the most sophisticated electronic apparatus. There are chambers for surgery and for therapy, and also a research unit. The complex is equipped also with single-patient pressure chambers.

About 400 surgical operations and more than 14,000 therapy sessions have been performed here.

(A photograph is given showing the center's complex of multiple-patient pressure chambers.)

FTD/SNAP
CSO: 1840/602

SCHOOL LUNCHES

Moscow SOVETSKAYA TORGOVLYA in Russian 14 Apr 84 p 3

NADZHAROV, A., special correspondent of Sovetskaya Torgoviya, L'vov

[Abstract] A discussion is presented of the Soviet school lunch program, with particular attention accorded to the experience in L'vov, Ukraine, where the program enjoys an exemplary status. The provision of hot school lunches in L'vov has been put on an industrial basis, with the production and distribution to schools organized on a systemic and scientific basis. The moving force behind the creation of a central food preparation plant has been Borys A. Pylypchuk, ably assisted and aided by the cooperation and understanding shown by the Party and government workers in the city. It is obvious that the time has come to implement such programs in all schools, and that ranking of schools and school districts in socialist competitions should take into account the functional level of their lunch programs.

[592-12172]

NURSE SHORTAGE

Moscow IZVESTIYA in Russian 3 Apr 84 p 3

GLADYSH, S.

[Abstract] The problem of nurse shortage in the USSR is addressed, with the acknowledgement that the problem has become serious enough to require attention from the highest state organs. Questionnaires circulated in Moscow and Ufa have shown that the most common causes of dissatisfaction in the nursing profession are low pay, lack of prestige, long hours and generally lack of appreciation. Such factors combine to produce low self-esteem and undermine the professional status of nurses. While many patients and individual physicians show high regard and appreciation for the work of nurses and their dedication to human welfare, certain administrative bodies have yet to show similar recognition in terms of salary and working conditions. Rectification of this problem rests with the highest authorities in the Soviet health care system.

[591-12172]

NEW DESIGNS FOR MEDICAL FACILITIES

Minsk SEL'SKAYA GAZETA i. Russian No 66, Mar 84 (unpaginated insert)

[Editorial]

[Abstract] Two plans were discussed for medical service buildings aimed at the rural service: a feldsher-midwife point and an ambulatorium (a rural ambulatory service center). The feldsher-midwife building provides for the following facility: waiting room, procedure-dressing room, a feldsher's room, physio-therapeutic office, midwife's office, living quarters for the feldsher. The plan for the ambulatorium calls for a two-story building providing for up to 7 office suites for various medical specialities and four apartments for resident physicians. During the current five year plan 131 feldsher-midwife points were constructed, but this effort should be intensified even more. Building designs are illustrated. Figures 5.
[625-7813]

URGENT AREAS FOR COOPERATION

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN - CHLENOV SEV in Russian No 2, Feb 84 pp 20-21

ZINNEKER, H., Director of the Epidemiological Center of the East German State Hygiene Inspection, GDR Ministry of Health, Chairman of the head Organization on the Topic Problem "Infectious Diseases and Vaccination Problems"

[Abstract] Considerable success has been achieved in the area of infectious diseases; modern diagnostic and vaccination techniques lowered the incidence and even liquidated totally a number of infectious diseases. In 1977 the Epidemiological Center of the State Hygiene Inspection of the German Democratic Republic Ministry of Health was selected by members of CEMA as the coordinating center for infectious diseases and vaccination problems. The following directions for scientific research were established: creation of a science base for further lowering of infectious diseases; development, improvement and standardization of immunoprophylactic and therapeutic as well as diagnostic methods; and unification of the evaluation methods of the effectiveness of disinfecting measures. More recently, viral studies were initiated on the role of viruses in immunopathologic diseases. Currently, 55 scientific

centers study the problem of infectious diseases in Bulgaria, Hungary, East Germany, Cuba, Poland, Czechoslovakia and USSR. The cooperative efforts cover studies of immunity in children, role of plasmids in enhancing resistance of bacterial pathogens to chemotherapy, control of rabies, control of staphylococcal infections, dysentery, salmonella, viral hepatitis, etc. Methods of disinfection and sterilization have been standardized. As a result of these coordinating efforts considerable advances were achieved. [621-7813]

BRIEFS

UZBEK CLINICS--A total of 50 childcare clinics have been put into operation in Uzbek SSR since the beginning of the year. There are now over 1,000 such clinics in the republic. The construction of large childcare clinics in cities and rural regions is contemplated during the forthcoming years. [Text] [Tashkent INTERNATIONAL SERVICE in Uzbek 1700 GMT 3 Apr 84]

NEW BELORUSSIAN MEDICAL COMPLEX --(BELTA)--The builders handed over to the physicians the keys to the new building, in which a republic kidney transplant center will be housed. With this, the construction of the largest medical unit in Vilnius, the republic clinical hospital, was concluded. Now it is a whole complex for treatment, prevention, and study. The complex's hospital can admit 1,000 patients at a time. Already in operation here are republic centers of cardiology and cardiac surgery, departments of hematology, gastroenterology, neurology, and other therapeutic and surgical specialties, and diagnostic services. The seven-story consultation clinic, in which there are offices equipped for diagnosis and treatment, can admit 700 patients in a shift. Vilnius University's department for the advanced training of physicians, which is based here, also received excellent premises. The majority of the patients of this complex is made up of village dwellers sent to the specialized centers by rayon doctors. And now patients get the advice of specialists in cardiology without even going to Vilnius. The first center in the republic for long-distance cardiological diagnosis has begun operation here. Using special apparatus from any hospital in the Vilnius zone, electrocardiograms can be transmitted here, and consultation organized at a distance on the tactics of treatment. [By V. Gavelenel [Text] [Minsk SOVETSKAYA BELORUSSIYA in Russian 24 Mar 84 p 2] 12461

SHORTAGE OF CORRECTIVE LENSES--The Ministry of Health and the Ministry of Medical Industry have examined the article "Optical Illusion?", and report that the deficiencies in supplying the population of the country, including residents of Moscow, with corrective eyeglasses were correctly depicted. The Ministry of Medical Industry has developed a plan of organizational and technical measures for developing capability, perfecting the organization of production, and raising the quality of glasses. A schedule has been developed for changing frame models which stipulates converting production to the modern technological material etrol, as well as increasing the production of metal frames. The Ministry of Chemical Industry is required to increase the delivery of etrol to the Ministry of Medical Industry from 500 tons to 1400 tons and to raise the quality of this material for the production of high quality frames. This year the Ministry of Medical Industry will deliver 25 million frames and

77 million lenses, according to the plan. The plan calls for putting 64 million lenses into production, which will permit decentering to be more widely adopted in frames with a large intercentral distance, and the aesthetic appearance of the glasses to be improved. The price-list for assembling and repairing glasses, developed by the USSR Ministry of Health on the basis of experience in advanced optical production work, will be perfected in the process of its application. [By V. Dvoryakovskiy, deputy minister of medical industry and N. Shmakov, USSR deputy minister of health] [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 28 Mar 84 p 3] 12461

CSO: 1840/619

RADIATION BIOLOGY

RADIATION HYGIENE CONFERENCE

Moscow MEDITSINSKAYA GAZETA in Russian 13 Jan 84 p 3

DUSHUTIN, K., candidate of biological sciences

[Excerpt] The first All-Union conference on timely questions of radiation hygiene has taken place in Obninsk.

Taking part in the discussion were leading scientists, specialists, physicians, engineers and organizers of science and industry, representing more than 70 of our country's scientific and other institutions.

In introductory remarks, Ye. Vorob'yev, corresponding member of the USSR Academy of Medical Sciences (AMN SSSR) and USSR first deputy minister of health, noted that radiation hygiene has developed into an applied science which interacts closely with the most important directions of economic and scientific activity. Speaking on the subject of prospects for further research, Ye. Vorob'yev emphasized the importance of comprehensive study of effects of adverse physical, chemical and other environmental factors on human beings, and of objective quantitative appraisal of risk factors in everyday life and in industry.

Main directions for further research were singled out in a paper by L. Il'in, member of AMN SSSR and chairman of the All-Union problem commission "Radiation Hygiene", and Doctor of Medical Sciences V. Knizhnikov. Among the most important unsolved problems, they mentioned the study of quantitative connections and relationships in the effects of small doses of radiation on the body, investigation of the combined and joint effects of the radiation factor and other factors, the expansion of comprehensive epidemicologic developments, and the use of computers for accomplishing these tasks.

Effects of the action of radiation factors on the organism were dealt with extensively at the conference, as were results of studies for establishing hygienic norms for ionizing radiation. Heightened attention is being paid to all kinds of long-term consequences of ionizing radiation's action, and to regularities governing the formation of irradiation doses received by human beings from natural and technogenic sources.

During the conference, A. Gus'kova, P. Ramzayev, V. Golikov and V. Knizhnikov, leading specialists in the field of radiation hygiene, told scientific personnel of the city about Soviet physicians' participation in the movement for the prevention of nuclear war.

UDC 577.391:547.963.3

MOLECULAR MECHANISMS OF INTERPHASE DEATH OF LYMPHOID CELLS: NATURE OF DISTRIBUTION OF SITES ATTACKED BY NUCLEASE IN CHROMATIN AND KINETIC COMPLEXITY OF DNA IN POLYDESOXYNUCLEOTIDE

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 17 Feb 82) pp 579-584

ZVONAREVA, N. B., ZHIVOTOVSKIY, B. D. and KHANSON, K. P., Central Scientific Institute of Roentgenology and Radiology, USSR Ministry of Health, Leningrad

[Abstract] Male mongrel white rats were used as experimental animals in a study of the nature of distribution of sites sensitive to nuclease attack during post-radiation decay of chromatin and determination of representation of DNA sequences of various periods of recurrence in polydesoxynucleotide on the basis of the quantitative ratio of single-helix and double-helix fragments of different length in the polydesoxynucleotide. It was found that, under the effect of ionizing radiation, products of enzymic digestion of chromatin, accumulated in the thymocytes due to internucleosome degradation, were excised from randomly situated genome sites and did not differ, in representation of nucleotide sequences of different degree of recurrence, from total DNA.
Figures 4; references 12: 2 Russian, 10 Western.
[614-2791]

UDC 577.391:612.112.94

MOLECULAR MECHANISMS OF RADIATION DEATH OF LYMPHOID CELLS: RADIOPROTECTIVE EFFECT OF CYSTEAMINE ON THYMOCYTE SUBPOPULATIONS, DIFFERING IN RADIOSENSITIVITY

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 25 Apr 82) pp 585-589

SOLDATENKOV, V. A., SOLOKINA, N. I., FILIPPOVICH, I. V. and ROMANTSEV, Ye. F., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Male (CBAXC57B1)F₁ mice were used in experiments aimed at explaining the degree of protection by cysteamine of thymocytes which are precursors of immunocompetent T-cells and the interconnection between radioprotective effectiveness of cysteamine and the change of conformation of superhelical DNA in protected cells. It was found that the radioprotective effect of cysteamine may be due, in part, to relaxation of superhelical DNA after incubation with a

a radioprotector. Radioprotective effect of cysteamine after its incubation with thymocytes for 20 minutes before gamma-irradiation was greater in fractions of more radiosensitive thymocytes than in those with more radioresistant cells. Complete relaxation of superhelical DNA of large and small lymphocytes occurred after their incubation with cysteamine in radioprotective concentrations. Relaxation was not due to formation of single-strand breaks. Partial recovery of superhelical conformation of DNA of small thymocytes before irradiation reduced the radioprotective effect of cysteamine. It was surmised that relaxation of superhelical DNA under the effect of radioprotectors indicates their intervention in regulation of DNA reparation processes in chromatin. Figures 2; references 13: 5 Russian, 8 Western.
[614-2791]

UDC 577.391:547.963.3

EFFECT OF BETA-MERCAPTOETHYLAMINE ON DEGRADATION OF DNA CONTAINING THERMAL LESIONS IN GAMMA-IRRADIATED BACTERIA CELLS

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 5 Jul 82) pp 590-594

KUZNETSOVA, Ye. A., FOMENKO, L. A. and GAZIYEV, A. I., Institute of Biological Physics, USSR Academy of Sciences, Pushchino

[Abstract] Effect of beta-mercaptoproethylamine on formation and repair of single-strand breaks in DNA of gamma-irradiated bacteria (*Bacillus stearothermophilus* 159), grown at different temperature is described and discussed. Radio-protective effect of beta-mercaptoproethylamine depends on the temperature of incubation of the bacteria and the presence of thermal lesions in DNA of these bacteria. Beta-mercaptoproethylamine reduces both the number of alkali-labile sites and true single-strand DNA in *Bac. stearothermophilus* cells and it also reduces the level of alkali-labile sites and true single-strand DNA breaks in *E. coli* cells at 52°C. Beta-mercaptoproethylamine protection comes not only from physico-chemical processes but also, probably to a greater extent, from the effect on the function of DNA metabolism enzymes. Figures 3; references 13: 6 Russian, 7 Western.
[614-2791]

UDC 577.391:547.963.3

CORRELATION BETWEEN RADIOSENSITIVITY OF ANIMAL BODY AND PECULIARITIES OF KINETICS OF REASSOCIATION OF ITS DNA

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 12 Apr 82) pp 595-598

KALASHNIKOVA, L. A., KRITSKIY, G. A. and KONONOV, I. O., Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow

[Abstract] Kinetics of reassociation of DNA of some mammal species (guinea pig, man, rat, rabbit) with various radiosensitivity were determined; the

parameters of the kinetic fractions of DNA of the mammal species were correlated with the magnitude of their radiosensitivity, determined by LD 50/30. It was shown that all DNA fractions studied have some degree of bodily radioresistance and that this radioresistance increases with increase in the relative level of the rapidly-reassociating fraction in DNA. Since the rapidly-reassociating fraction contains satellite DNAs, it is assumed that satellite DNAs are quite important in stabilizing the genome. When there is an increase in kinetic complexity of moderately repetitive sequences and a rise in percent of the moderate unique fractions of DNA the bodily radiosensitivity decreases. Figures 2; references 11: 7 Russian, 4 Western. [614-2791]

UDC 577.391.547.425

MOLECULAR MECHANISMS OF RADIOPROTECTIVE ACTION OF BENZOTHIADIAZOLE DERIVATIVES

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 7 Apr 82) pp 616-619

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[Abstract] Study of the correlation between the electron structure and the radioprotective activity of some substituted benzothiadiazoles showed that their radioprotective effect correlates with their capacity to participate in electron transfer. Radioprotection by benzothiadiazole derivatives may be realized by complex formation with transition metals--wherein the ligands are the benzothiadiazole molecules--which blocks access of free radicals to nucleic acid bases most injured by radiation. The radioprotective effect increases with an increase of the energy of the bond of the complexes and diffusion mobility of the radioprotector molecules. Figures 1; references 8 (Russian)
[614-2791]

UDC 577.391:576.3

MODELLING DOSE-EFFECT RELATIONSHIPS OF CELL POPULATIONS EXPOSED TO IONIZING RADIATION OF VARIOUS QUALITY

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 20 Apr 81) pp 624-629

VALEYEV, A. K. and MALINOVSKIY, O. V., Leningrad Institute of Nuclear Physics imeni B. P. Konstantinov, USSR Academy of Sciences, Gatchina

[Abstract] Influence of the quality of ionizing radiation on the form and behavior of functions of S(D), (fraction of surviving cells of a population irradiated by dose D) obtained for fixed functions of reaction of the cell was

studied and a formula for finding the survival rate of an irradiated population is devised by simulating the reaction of an individual cell to the effect of a specific quantity of irradiation with consideration of the probability distribution of absorbed energy in the cells. The models derived may be used to describe the relative biological effect, the oxygen effect and chemical modification of the cell response. Figures 3; references 5: 1 Russian, 4 Western. [614-2791]

UDC 577.391

SOME REGULARITIES OF CHANGE OF RELATIVE NUMBER OF HEMOPOIETIC STEM CELLS EXPOSED TO LONG-TERM IRRADIATION AT DIFFERENT DOSE MAGNITUDES

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 4 Mar 82) pp 630-636

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[Abstract] A model which describes the nature of change of the relative number of hemopoietic stem cells as a function of time during long-term radiation in a wide range of doses and dose rates (0.01-100 and more Gy/day) is devised and discussed. Satisfactory agreement was found between data calculated according to the model and experimental data concerning the change of number of stem cells after irradiation of mice in the range of doses and dose rates studied. The specific rate of cell division in the cycle increased and the duration of the mitotic cycle decreased from 98 to 7 hours with an increase of dose rate by an order of magnitude of 3 or more. Figures 2; references 17: 13 Russian, 4 Western.

[614-2791]

UDC 577.391:612.015.33:612.1:616-001.4

POSSIBILITY OF BIOLOGICAL INDICATION OF RADIATION INJURY BY DEOXYNUCLEOSIDE AND DEOXYNUCLEOTIDE LEVEL IN BLOOD AFTER RADIATION-MECHANICAL INJURY

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 30 Jun 82) pp 637-641

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[Abstract] Data concerning the level of deoxynucleosides and deoxynucleotides in male rabbit blood serum and in blood clot leukocytes as a function of the radiation dose and elapsed time after "pure" irradiation and radiation-mechanical injury are presented and discussed. The presence, after "pure" radiation injury, of a linear dependence of the effect on the dose makes it possible to use deoxycompounds level to assess radiation dose in a range from 1.5 up to 6.5 Gy throughout a 6-96 hour post-radiation period. After radiation-mechanical injuries, there is a non-linear dependence of the deoxycompounds

level in leukocytes on the dose and a linear dependence on the time, so that accuracy of determining the dose depends, largely, on the relationship of the dose and the time elapse after radiation-mechanical injury. Data obtained indicate that deoxycompounds levels in rabbit blood can be used for biological indication of radiation injury under conditions of radiation-mechanical injury. Figure 1; references 10: 9 Russian, 1 Western.
[614-2791]

UDC 557.391:616-001.28

POSTIRRADIATION CHANGE IN RAT RADIOSENSITIVITY AS FUNCTION OF DOSE OF PRELIMINARY IRRADIATION DURING CUTANEOUS RADIATION SICKNESS

Moscow RADIobiologiya in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 1 Apr 82) pp 642-647

AVETISOV, G. M. and ZHARKOVA, G. P., Institute of Biophysics, USSR Ministry of Health, Moscow

[Abstract] Postirradiation cutaneous sensitivity was studied in 1500 male mongrel rats (weight, 180-220g) subjected to soft 17kV X-radiation after 10, 18 or 25 Gy preliminary exposure. Under these conditions, rats developed cutaneous radiation sickness and most animals died on the 13-16th day. Decrease of the amount of residual injuries with time is common for all doses of preliminary irradiation used and for 10 and 18 Gy doses, there is a state of rather pronounced hyper-resistance on the 1st day and from the 10-25th day. Ten Gy doses cause wave-form changes in the number of peripheral blood leukocytes, bone marrow karyocytes and intestinal cellular structure. After the 7th day, there was rapid restoration of the number of leukocytes and bone marrow karyocytes back to the initial level. Dynamics of proliferative activity of dividing elements of the oropharynx mucosa, small intestine, skin and bone marrow and residual injury after development of cutaneous radiation sickness after a 10 Gy dose are graphed, described and discussed. It was concluded that the postirradiation change of rat radioresistance depends upon the preliminary radiation dose, the period of application of the test-effect and the state of the critical system for cutaneous radiation injury. Figures 2; references 19: 17 Russian, 2 Western.
[614-2791]

ANTIRADICAL PROTECTION SYSTEMS OF PLASMA MEMBRANES IN IRRADIATED ORGANISM

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 2 Jun 82) pp 648-650

RYSKULOVA, S. T., VERBOLOVICH, V. P., PETRENKO, Ye. P., TSVETKOVA, T. V. and BALAKHCHI, T. A., Institute of Zoology, KaSSR Academy of Sciences; Scientific Research Institute of Clinical and Experimental Surgery, KaSSR Ministry of Health, Alma-Ata

[Abstract] Investigation of rat liver plasma membranes (PM) and liver homogenate for the presence of antiradical systems in them involved whole body X-irradiation of male rats and decapitation of them 1, 24, 72 hours or 7 days later. Greatest variation in functioning of PM occurred in the first hours after irradiation at which time reduction of superoxide dismutase (SOD), activity was accompanied by catalase induction and increase of reduced glutathione (GR) was combined with increase of glutathione (GSH) level. After elapse of 7 days from the irradiation, enzymic processes were damped and GSH level decreased while glutathione peroxidase (GP) and GR activity decreased and GSH level in the homogenate decreased. Inhibition of PM activity was attributed to the effect of cytosole. Activity of the membrane-bound enzymes is determined by the fatty-acid composition of the membrane and its liquidity. The specific post-irradiation cholesterol concentration increased and the phospholipids level decreased with a peak 7 days after irradiation. The initial structure of the membrane changes with the increase of the solid phase which may be one of the causes of inactivation of the enzymes studied. Results showed that the surface membrane contains a system responsible for the course of the process of free-radical oxidation which confirms the fact that the external cell membrane plays a leading role in development of radiation injuries. Figure 1; references 11: 3 Russian, 8 Western.

[614-2791]

RADIATION INDUCED BINDING OF 2-AMINO-5,6-DIHYDRO-1,3-4H-THIAZINE TO DNA

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 16 Jun 82) pp 650-653

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[Abstract] Detailed study of the nature of radiation-induced bonds between DNA and a radioprotector, 2-amino-5,6-dihydro-1,3-4H-thiazine (2-ADT), used as an example, was described and discussed. Data obtained from the use of gel-filtration and ^{35}S -2-ADT show that the number of molecules bonding with DNA increases with the increase of radiation dose. Lower concentrations of

2-ADT produced more bonding molecules at the same radiation level. Post-irradiation treatment with 3 M LiCl or 3 M urea did not affect the radioactivity level of the DNA fraction obtained by gel-filtration. No appreciable bonding was noted after mixing separately-exposed DNA and the protector. Results of the study showed that the cause of radiation-induced bonding of DNA with the protector is the formation of covalent cross-links being realized via short-lived active macromolecules and (or) protector. References 9: 5 Russian, 4 Western.
[614-2791]

UDC 577.391:547.963.3

MODIFIABILITY OF INJURIES IN RAT HEPATOCYTE DNA AFTER WHOLE BODY X-IRRADIATION WITH AID OF CYSTEAMINE AND 8-BROMOCAFFEINE

Moscow RADIobiologiya in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 5 Jul 82) pp 653-656

SMIRNOVA, I. S., SUSLOV, A. V. and NOSKIN, L. A., Leningrad Institute of Nuclear Physics, Gatchina

[Abstract] Effect of cysteamine and 8-bromocaffeine on the level of DNA double-strand breaks (DR) forming in non-proliferating hepatocytes after whole-body irradiation of male mongrel rats (weight 150-200 g) by 1-10 Gy doses is described and discussed. Intraperitoneal injection of cysteamine or 8-bromocaffeine decreased the level of DNA DR in comparison with that in control rats. First DNA DR in hepatocytes of rats receiving no radiomodifiers was noted after irradiation by a 1 Gy dose whereas it occurred after use of a 4-6 Gy dose after injection of cysteamine or 8-bromocaffeine. Further changes of DR level stopped completely after time elapse of 6 hours after irradiation. DR recorded after this was called residual DR. Injection of 8-bromocaffeine increased the residual DNA DR level while injection of cysteamine decreased it. This was assumed to be confirmation of the major role of fixed DNA DR in formation of a lethal effect in a cell. Figure 1; references 11: 5 Russian, 6 Western.
[614-2791]

UDC 577.391:612.015.33

UNSCHEDULED DNA SYNTHESIS AFTER GAMMA-IRRADIATION OF HUMAN LYMPHOCYTES AT STAGE G₁

Moscow RADIobiologiya in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 29 Jul 82) pp 656-659

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[Abstract] Study of unscheduled DNA synthesis in various periods of the G₁-stage under normal conditions and after gamma irradiation of nuclei of human lymphocytes 10, 15 and 20 hours after PHA stimulation showed that unscheduled DNA synthesis is a function of radiation dose and time elapse after the PHA-stimulation. References 11: 6 Russian, 5 Western.
[614-2791]

UDC 577.391:611.43/47

CHANGE OF CIRCADIAN RHYTHM OF HYPOTHALAMUS-HYPOPHYSIS-ADRENAL SYSTEM IN REMOTE PERIODS AFTER IRRADIATION

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 1 Apr 82) pp 689-691

PROKUDINA, Ye. A., Central Scientific Research Institute of Roentgenology and Radiology, USSR Ministry of Health, Leningrad

[Abstract] Study of the circadian rhythm of the hypophysis-adrenal system according to the corticosterone level in blood of male rats (weight 180-200 g) 3, 6 and 12 month after exposure to radiation dose of $1186.8 \cdot 10^{-4}$ Ci/kg is described and discussed. Corticosterone level in blood plasma of control (unexposed) rats after 3 months was higher in the morning than in the evening. This was also true for 65 percent of experimental rats while the hormone level in the evening hours was unchanged or lower than that in the morning hours in these animals at 3 months. After 6 months, there was disturbance of the corticosterone level in 47.8 percent of control rats and it remained unchanged in 57.2 percent while even greater disturbances of the hormone level was seen in experimental rats. This picture remained relatively unchanged in both groups after 12 months. References 8: 6 Russian, 2 Western.
[614-2791]

UDC 577.391:612.273:621.039

RADIOSENSITIVITY OF ORGANISM AFTER IRRADIATION OF ANIMALS IN MODIFIED GAS ENVIRONMENT: EFFECT OF REPEATED SHORT-TERM BREATHING OF PURE OXYGEN ON RADIOSENSITIVITY OF ANIMALS

Moscow RADIOBIOLOGIYA in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 14 Apr 82) pp 692-693

VASIN, M. V. and KOROLEVA, L. V.

[Abstract] Effect of repeated breathing of pure oxygen for 5-20 minutes at normal pressure of bodily radioresistance of pedigree mice exposed to ^{60}Co in 8.0-11.0 Gy doses at dose rates of 1.63-1.73 Gy/min is described and discussed. Repeated 10 minute and 20 minute hyperoxia at normal pressure within 48 hours for 2 weeks before exposure reduced radioresistance of the mice. Repeated 5-minute periods of hyperoxia under the same conditions did not affect post-radiation survival rate of the mice. Repeated 10-minute periods of hyperoxia before exposure worsened the course of bone marrow and intestinal syndromes in radiation sickness. Reduction of radioresistance of the mice after repeated breathing of pure oxygen in a period of 2 weeks was attributed to cumulation of early toxic manifestations of normobaric hyperoxia. References 4: 3 Russian, 1 Western.
[614-2791]

CHANGE IN MOUSE SKIN AT EARLY AND LATE PERIODS AFTER EXPOSURE TO X-RADIATION
AND ACCELERATED HELIUM IONS

Moscow RADIobiologiya in Russian Vol 23, No 5, Sep-Oct 83
(manuscript received 14 Jul 82) pp 694-695

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Moscow

[Abstract] Degree of cutaneous injury after various doses of accelerated helium ions and X-radiation was compared in 60 male mongrel white mice (weight 18-20 g) exposed to radiation doses ranging from 3.0 up to 40 Gy. Skin changes, including atrophy of varying degree, edema and epilepsy, 1.5, 2 and 3.5 months after exposure were approximately the same after both forms of exposure. The coefficient of relative biological effectiveness of helium ions for the criterion "clinical state of the skin 3.5 months after exposure" was 1.3. Figures 2; references 4 (Western)
[614-2791]

VETERINARY MEDICINE

UDC 619:612.017:577.48:613

ENVIRONMENTAL FACTORS IN IMMUNOBIOLOGICAL RESPONSIVENESS

Moscow VETERINARIYA in Russian No 3, Mar 84 pp 33-34

SELIVANOV, A. V., IVANOVSKIY, E. V. and BORISOVICH, Yu. F., All-Union GNIKI [State Control Scientific Research Institute of Veterinary Preparations]

[Abstract] A synopsis is presented of the effects of environmental factors on the immunological competence of livestock, in light of the industrialization of agriculture. Factors which affect the state of health of farm animals can be categorized as biological, chemical and physical, and can act in isolation or--more commonly--in combination. Among the more important biological factors are air pollution with potentially-pathogenic microorganisms, while the chemical factors can include antibiotics in feed and as medications, various disinfectants, herbicides and other agricultural chemicals. Physical factors encompass variations in lighting in barns and other holding areas, which may have a profound physiological effect. All of these factors may to one extent or another alter factors affecting the function of the immune system, or influence it directly, and thereby modify the animal's ability to launch an appropriate immune response, whether in response to vaccination or infection.

[586-12172]

UDC 619:616.981.48-084:636

PREVENTION OF ANIMAL COLIBACILLOSIS

Moscow VETERINARIYA in Russian No 3, Mar 84 pp 41-43

SIDOROV, M. A., Moscow Technological Institute of the Meat and Dairy Industry and GUSHCHIN, V. N., Main Veterinary Administration, USSR Ministry of Agriculture

[Abstract] An analysis of neonatal gastrointestinal diseases in cattle has revealed that the majority of the cases consist of colibacillosis, and that 37% of the latter cases are ascribable to *E. coli* 0101, with 16% to 08, and 12% to 078. A significant factor in preventing calf loss due to this disease entity is strict adherence to established sanitary norms and proper care of the cow and her calf. Among the more important measures are immunization of the cows with vaccines prepared from the more important serogroups,

especially with those that produce exotoxin and have been shown to offer a wide spectrum of protection. A direct measure includes feeding the calves 80-100 ml of hyperimmune serum with the first colostrum, in conjunction with antibiotic therapy.

[586-12172]

UDC 619:616.5-002.828-085:636

CATTLE AND SWINE CANDIDIASIS: THERAPY AND PREVENTION

Moscow VETERINARIYA in Russian No 3, Mar 84 pp 43-46

SEBRYAKOV, Ye. V., PARAKIN, V. K. (deceased) and VORONYANSKIY, V. P.,
Don Agricultural Institute

[Abstract] A discussion is presented of the clinicopathologic features of system candidiasis in calves and piglets, since such clinical conditions are frequently misdiagnosed and their true contribution to morbidity and mortality may be underestimated. The severity of the systemic conditions is shown to be age-dependent, with the adult animals often serving as carriers and sources of infection for the young. Prevention of the disease in the young animals depends on strict adherence to sanitary standards and clinical alertness, with removal and isolation of infected animals. Therapeutic measures are directed at eradication of the infection; non-specific modalities are employed to enhance the physiological status of the animals. The most commonly employed antibiotics in the case of the young and adult animals are nystatin and levorin. Figures 2.

[586-12172]

UDC 619:576.851.48:576.807.8

IDENTIFICATION OF ENTEROBACTERIACEAE

Moscow VETERINARIYA in Russian No 3, Mar 84 pp 70-72

SOCHNEV, V. V. and KOSORLUKOVA, Z. Ya., NIVI [Veterinary Scientific Research Institute] of the Nonchernozem Zone of the RSFSR

[Abstract] Tabular data are presented on identification of member micro-organisms of the Enterobacteriaceae family on the basis of standard biochemical tube tests, and tests utilizing indicator paper strips. The comparative studies were conducted on standard type cultures and isolates obtained during epizootic outbreaks, and encompassed *E. coli*, *Citrobacter freundii*, *Enterobacter cloacea* and *E. aerogenes*, *Salmonella typhimurium*, *Proteus vulgaris*, *P. mirabilis* and *P. morganii*, *Serratia marcescens*, *S. dispar* and a paracolon. The results obtained with the standard and the paper-strip method were identical, with the distinction that the latter approach was technically simpler and less expensive.

[586-12172]

CONFERENCES

CONFERENCE ON INFORMATION NEUROSES

Tbilisi ZARYA VOSTOKA in Russian 10 Mar 84 p 4

[Abstract] The article reports on proceedings of an international symposium on methods of diagnosing, preventing and treating neuroses. The symposium, which was held recently in Berlin, was sponsored by "Intermozg", the international organization for study of the brain. Affiliated with this organization are various scientific and clinical institutions of countries of the Council for Mutual Economic Aid which are working on problems of physiology and pathology of the brain. A number of the Soviet scientists, particularly representatives of the Georgian republic, who took part in the symposium are identified. Brief summaries are given of their papers and the symposium's discussion of them.

Professor M. Khananashvili, corresponding member of the USSR Academy of Medical Sciences and vice-president of "Intermozg", spoke at the opening of the symposium. It is noted that the symposium unanimously endorsed Khananashvili's concept of information neuroses. According to this concept, such neuroses result from the effects of the following factors on the brain over an extended period of time: the necessity of processing a large amount of information in conditions of chronic shortage of time and high behavioral motivation. Studies done in line with this concept reportedly have led to methods for heightening the nervous system's resistance to information neuroses without the use of pharmacologic means. Noting that drugs are often employed more broadly than circumstances justify, participants in the symposium called for the intensive development of nonmedicinal methods for the prevention and treatment of pre-neuroses and neuroses.

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